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Inspiron 8600 - Pure Power

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- Integrated 802.11b and Bluetooth™ wireless technology
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- 64MB Intel® StrataFlash™ ROM

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Inspiron 1150 - Outstanding Value

processor	Intel® Celeron® Processor 2.4GHz
operating system	Microsoft® Windows® XP Home Edition
memory	NOW with 512MB DDR SDRAM Shared with Graphics*
hard drive	30GB* Hard Drive
graphics card	Integrated Graphics
optical drive	24X Max CD-RW/DVD* Combo Drive (Burn CDs and watch DVDs)
screen	14.1" XGA TFT Display (1024x768 res)
software	Microsoft® Works 7.0 - OEM Version 56K Capable Modem

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Microsoft® Windows® XP Home Edition

NOW with 512MB DDR SDRAM Shared with Graphics*
30GB* Hard Drive
Integrated Graphics
24X Max CD-RW/DVD* Combo Drive (Burn CDs and watch DVDs)
12.1" WXGA TFT Display (1280x800 res)
Microsoft® Works 7.0 - OEM Version 56K Capable Modem

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Microsoft® Works 7.0 - OEM Version 56K Capable Modem

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Dimension 3000

Great Value

processor	Intel® Pentium® 4 Processor 2.8GHz with 1MB Cache
operating system	Microsoft® Windows® XP Home Edition
memory	NOW with 512MB DDR SDRAM Shared with Graphics*
hard drive	40GB* Hard Drive
graphics	Integrated Graphics
optical drive	48X Max CD-RW Drive (Burn/play CDs)
monitor	17" CRT Monitor (16.0" v.i.s.)
software	Microsoft® Works 7.0 - OEM Version



Dimension 4700

Powerful and Fun

processor	Intel® Pentium® 4 Processor 530 with HT Technology (3.0GHz, 1MB L2 Cache, 800MHz FSB)
operating system	Microsoft® Windows® XP Home Edition
memory	512MB DDR SDRAM at 400MHz
hard drive	160GB* Hard Drive
graphics	NOW with 128MB PCIe* x16 ATI® Radeon® X300 Graphics
optical drive	48X Max CD-RW/DVD* Combo Drive (Burn/play CDs and watch DVDs)
monitor	17" CRT Monitor (16.0" v.i.s.)
software	Microsoft® Works 7.0 - OEM Version



Dimension 4700

Great Family PC

processor	Intel® Pentium® 4 Processor 520 with HT Technology (3.0GHz, 1MB L2 Cache, 800MHz FSB)
operating system	Microsoft® Windows® XP Home Edition
memory	NOW with 512MB SDRAM at 400MHz Shared with Graphics*
hard drive	40GB* Hard Drive
graphics	Integrated Graphics
optical drive	48X Max CD-RW Drive (Burn/play CDs)
monitor	17" Flat Panel Monitor
software	Microsoft® Works 7.0 - OEM Version



Dimension 8400

Ultimate Entertainment

processor	Intel® Pentium® 4 Processor 520 with HT Technology (2.80GHz, 1MB L2 Cache, 800MHz FSB)
operating system	Microsoft® Windows® XP Home Edition
memory	512MB DDR SDRAM at 533MHz
hard drive	80GB* Hard Drive
graphics	128MB PCIe* x16 ATI® Radeon® X300 Graphics
optical drive	48X Max CD-RW/DVD* Combo Drive (Burn/play CDs and watch DVDs)
monitor	17" Flat Panel Monitor
software	Microsoft® Works 7.0 - OEM Version

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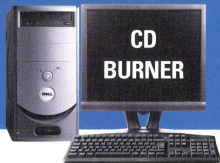
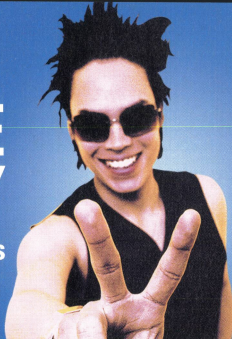


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on Dell™ selected systems

Now that's a deal hard to forget.



Dimension 3000 - Outstanding Value

processor	Intel® Pentium® 4 Processor 2.8GHz with 1MB Cache
operating system	Microsoft® Windows® XP Home Edition
memory	NOW with 512MB DDR SDRAM Shared with Graphics*
hard drive	40GB* Hard Drive
graphics card	Integrated Graphics
optical drive	48X Max CD-RW Drive (Burn/play CDs)
monitor	17" Flat Panel Monitor
software	Microsoft® Works 7.0 - OEM Version

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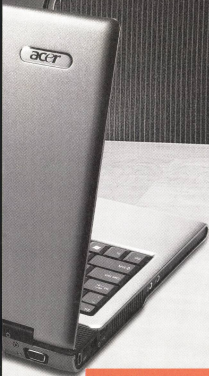
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TravelMate 3202XCI

STYLISH PERFORMANCE

- Intel® Centrino™ Mobile Technology
- Intel® Pentium® M Processor 725 (1.6GHz, 2MB L2 cache, 400MHz FSB)
- Intel® PRO/Wireless Network Connection 802.11b/g
- Microsoft® Windows® XP Professional
- 256MB DDR SDRAM
- 40GB hard disk drive
- 14.1" active colour screen
- ATI® 64MB graphics accelerator
- DVD+CD-RW combo drive
- SignalUp
- Internal 56K modem + 10/100/1000 LAN + Bluetooth
- 3-in-1 multi memory card reader (SD/MS/MMC)
- Weighs 2.18kg
- 2 Hour Commitment Warranty Express Service**

Upgrade to

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\$3,299

RRP inc GST
Rent: \$28.34 per week*

Acer recommends Microsoft® Windows® XP Professional for versatile mobile computing.

TravelMate 2301LC



GREAT VALUE

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- 40GB hard disk drive
- 15" active colour screen
- DVD+CD-RW combo drive
- Internal 56K modem + broadband-ready* 10/100 LAN
- 2 Hour Commitment Warranty Express Service**

RRP inc GST
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\$1,599

Upgrade to

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TravelMate 4001WLMi



SignalUp

15.4" WIDESCREEN

- Intel® Centrino™ Mobile Technology
- Intel® Pentium® M Processor 775 (1.5GHz, 2MB L2 cache, 400MHz FSB)
- Intel® PRO/Wireless Network Connection 802.11b/g
- Microsoft® Windows® XP Home
- 512MB DDR SDRAM
- 40GB hard disk drive
- 15.4" active colour widescreen
- DVD Dual (Play and burn DVDs and CDs)
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\$2,499

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TravelMate 8003LCi



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- 512MB DDR SDRAM
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- 15" active colour screen
- ATI® 128MB graphics accelerator
- DVD+CD-RW combo drive
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- Internal 56K modem + 10/100/1000 LAN + Bluetooth
- Smart Card security, 4-in-1 memory card reader
- 2 Hour Commitment Warranty Express Service**

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AE11205

CONTENTS

This month's cover stories



Digital music

Turn your PC into the ultimate home audio setup with APC's expert guide to the best players, online music sources and ways to manage and mix your tracks.



77

Voice over IP 100

Dan Warne explains how to cut your phone bill in half and get free long distance calls with Voice over IP.

10 power systems 56

Whether it's video editing, graphic design or extreme gaming, Nick Race and Matthew Overington check out 10 systems designed with multimedia in mind.

.NET for Linux 18

Can Mono really succeed in providing an open source equivalent to Microsoft's much-hyped .NET? David Braue reports.

Digital SLRs 62

Matthew Overington and Robert Craft get bitten by the shutter bug and look at three top-of-the-line digital SLR cameras.



56



62

RAGS 2 MIXES

98

Remix new and exclusive tracks from Groove Terminator and Pocket, included on this month's CD set, to be in the running for airplay on FBI radio.

Win one of three Creative Zen 20GB hard drive music players, valued at \$499, plus \$100 to spend at the ninemsn Music store.



On Test



WORKSHOP

Reviews

Processor	Intel Xeon 32/64-bit
Graphics cards	ATI Radeon X800 Pro Nvidia GeForce 6800GT
Networking	GS 724T SmartSwitch
Internet	Unwired wireless broadband
Hardware	Com-Tek CL-56 notebook
Software	Microsoft Visual Studio .NET 2005 Fedora Core 2 (Red Hat freeware OS v2) Text Pipe Pro 7 (convert and extract data) PageQ Editor (browser/media player)
Best buy	Sub-\$1,000 PCs Wide-screen notebooks

apc Labs Challenges

Hardware	Sub \$4,000 power systems Digital SLR cameras Laser printers
Software	System monitoring utilities

Starts page 33

Need to Know

Technotes	Linux patent problems MP3 player wars Beyond Wi-Fi
Exchange	Mark Stevens
Feature	.NET for Linux
Opinion	Dan Warne Mary Jo Foley
Epinions	Readers' letters
Watchdog	Customer service issues

Starts page 13

Windows	Serious Samurize
Linux	Email server, part 2
Admin	Messaging
Internet	Apache Web Server, part 5

Starts page 109

Downtime

Gear	Projectors Wireless DivX SMS on your home phone Personal media players Fingerprint hardware USB watches Mod your iPod USB novelties
-------------	--

Games

Doom 3 Top 5 gaming fight club match-ups
--

Chip Chat



Starts page 145

**Subscribe now
for your chance to**

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LCD Monitor**



See page 64

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Music POWER KIT

Play, Manage, Mix, Sample and Listen are the themes for our comprehensive Music Power Kit, designed to let you explore the possibilities of digital music.

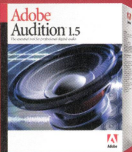
Play: we've collected a range of the latest music and audio players.

Manage: the best file tagging and management utilities so you better manage your music collection.

Mix: mix tracks with ACID Xpress 4.0 (the complete, junior version of ACID PRO), a 30-day trial version of Adobe Audition 1.5, or with any of the other mixing programs included on disc.

Sample: use these included tracks from renowned remix artists such as Groove Terminator and Pocket, and loops from Sony Music to create your own remixes.

Listen: play MP3s from over 50 exciting new Australian and international talents.



Steinberg Clean 4

Steinberg Clean is an audio restoration utility from Pinnacle Systems. It uses professional audio restoration technologies to remove unwanted noise from your vinyl LPs, MP3s and cassettes.

We've also included trial versions of Pinnacle Instant Copy 8, Studio 9 and Steinberg WaveLab 5.



As sold for \$49.95

For Windows 98, Me, 2000, and XP. Requires online registration.



Full CD index

CD 1

Full-working versions

- PRITG 1.15 — full-working version • Special offer
- SoundEdit Pro 1.1 — full-working version • SoundEdit Pro 2 — trial version • Special offer
- Steinberg Clean 4 — full-working version • Pinnacle Instant Copy 8 — trial version • Pinnacle Studio 9 — trial version • Steinberg WaveLab 5 — trial version • Special offer
- What's On My Computer 1.0 — full-working version
- What's On My Computer 2.0 — trial version • Special offer

Feature

- Ad Muncher 4.6 — exclusive extended trial
- Solid Capture 2.0 — Special offer
- TextPipe Pro 7.0.7 — Special offer
- VoIP software
- Asterisk 1.0 • Firefly Softphone 1.9.1 • iChat AV 2.1 • Linphone 0.12.2 • PhoneGain 0.79 • Sijphone for Linux 1.3 • Sijphone for Mac OS X 1.3 • Sijphone for Windows 1.3 • Windows Messenger 5.0 • X-Lite for Mac OS X 2.0 • X-Lite for Windows 2.0

Labs Challenge

- Monitoring software
- Freemeter 2.8 • Hardware Sensors Monitor 4.1.4.4

- Motherboard Monitor 5.3.7 • Serious Samurize 1.55
- SpeedFan 4.15

Workshop

- Email server, part 2
- Clam AntiVirus 0.75 • SpamAssassin 2.64 • SpamAssassin Milter plug-in 0.2.0

MobileJukebox

- RealPlayer for Palm OS 1.0 • RealPlayer for Pocket PC 1.0

Serious Samurize

- Meter artwork • Serious Samurize 1.55

Task wizard

- Disk maintenance batch file

Toolskit

- Ad-Aware SE Personal Edition 1.04 • Adobe Reader 6.0.1 • ATI Catalyst Software Suite 4.7 for Windows 98/Me • ATI Catalyst Software Suite 4.9 for Windows 2000/XP • Core FTP Lite 3.1b • DirectX 9.0c • DivX 5.2.1 • Gsplit 1.8 • Pegasus Mail 4.21c • PowerPoint 2003 Viewer • RealPlayer 10 • Spybot — Search & Destroy 1.3 • Winamp 5.05 Free • Windows Installer 2.0 for Windows 95 • 98 and Me • Windows Installer 2.0 for Windows NT 4.0 and 2000 • Windows Media Player 10 • WinRAR 3.30
- Xnews 5.04.25

Browsers

- Microsoft Internet Explorer 6.0 SP1 • Mozilla Firefox 1.0
- Preview Release • Safari 1.0

CD 2

Feature

- ACID Xpress 4.0b — ACID Music Studio 5 offer
- Music and Games free MP3 offer — free MP3 voucher

Music Power Kit

Listen

- [=LEGION=] — Legion • All the Sundays — Montoya's Song
- Ange — You are so far away • AUFSCHLAG — The Drones
- Aviaze — Parallel • BEDLAM — Take Me Home • bespinchos — deep inside you • Chain of Silence — United Surrender
- Chesokos — Kentucky Water • Ded Phoenix — Ash
- Wednesday • Dedli Cil — Clear ya Mind • Digital Clockwork
- Electrical Whore • emergency, squirrel! — 4 Dimensional
- Space Time (is a Donut) • Emily Zuzik — That's the Way
- Falling Nine — Garden of Angels • For Your Protection
- Cops • furiousball — A Fog • Girl With a Monkey
- Temptation • Griffin — This World • Gwydy — Dopeface • Havok — Turn Back • Indilounge — Moonwind • Inking

SoundEdit Pro 1.1

SoundEdit Pro is a full-featured digital audio editing app with a wide variety of audio recording, mixing, editing, analysing and effects processing features.



For Windows 98, Me, NT 4.0, 2000, XP and Server 2003. Requires online registration.

PRTG 1.15

Set up and run a monitoring station for SNMP-enabled networks with PRTG, a Windows-based monitoring utility that keeps an eye on bandwidth usage and other network parameters via SNMP.



For Windows 95, 98, Me, NT 4.0, 2000, XP and Server 2003.

What's On My Computer 1.0

An information-rich Windows file navigator, Innovatools' What's On My Computer gives you the properties of any file you highlight, then searches the Web for more information.



For Windows 98, Me, NT 4.0, 2000 and XP.

Voice over IP software

We've selected a number of programs that will enable you to make VoIP calls over the Internet to normal phones. They range from the Australian-developed Firefly (preconfigured to work with the FreshTel VoIP service) to Linphone for Linux, X-Lite for Mac and lots more.

— How Acute — inrush — Broken Incontrol — Jamison Young — How Far — kay — chet — Kayden — Sydney — L.A. Carpool — Salsa Inferno — Last Minute — Liverpool Kisses — Legless — Rock Star — Lelu — Painted Lines — M.U.T.E — Neurosis — Norwegian Celery Farmers — Evil Dr. Skoll — Nothing For Now — We Have to Fight — OTB — get it on — Othello — Lift Me • Product of Environment — soothing — Rikki Gann — I Can See • Shadow Walker — Shadow Walking — SHAKHAN — Sandstorm • Shrunken Headz — If I did that to you • Sojour — Silence • Subtract — Mark of the Lion • Telemetry — Override • The Boots — Boring Life • The Dontcares — dodge dart — 69 • The Magus — inabsentee • The Nurse Who Loved Me — Whispering Help • The Regulators — Above the Law • The Rye Catchers — Undertaken • Vendetta — Shotgun Theory

Manager

Abander TagControl 2.3 • Dr Tag 3.0.1 • EasyTAG 0.31 • File Audio Processor 3.4.7.0 • Helium 2.1.8 • iTunes for Mac OS X 4.6 • iTunes for Windows 4.6 • Media Tagger 1.3 • MediaMonkey Standard 2.2.2 • MP3 ID3X 3.0.1 • MP3 Rager 5.8.4 • Mp3tag 2.24 • SmartTagger 0.1 • Tag&Rename 3.1.5 • TagScanner 4.8 • The Godfather 0.62

Mix

ACID Xpress 4.0b • Acoustica MP3 Audio Mixer 2.471

Ad Muncher

Ad Muncher is an Australian program that gives you more control over your Web surfing by blocking ads and pop-ups in all browsers and in programs such as iCC. Ad Muncher is normally available for a 30-day trial, but APC readers are able to use it exclusively for 90 days.

• Adobe Audition 1.5 • Audacity for Linux 1.2.2 • Audacity for Mac OS X 1.2.2 • Audacity for Windows 1.2.2 • DJPlay 0.2.0 • KraMixer DJ Software 1.0.3 • MixVibes 5 Free • MixVibes 5 Pro • Ots CD Scratch 1200 1.00.032 • OtsDJ 1.00.184 • OtsTurntables Free 1.00.012 • Tplayer V1R10 • Tracker DJ Studio for Mac OS X 2.5.3 • Tracker DJ Studio for Windows 2.5.3 • Virtual DJ Mk III

Play

Air Whisper 1.4.1 • Audion 3.0.2 • Domino Player 1.00 • iTunes for Mac OS X 4.6 • iTunes for Windows 4.6 • Media Jukebox 8.0.400 • MP3 Tunes 2.0 • MP3 WAV Studio 5.0.40805 • mp3blaster 3.2.0 • Quintessential Player (QCD) 4.51 • RealPlayer for Linux 10 • XMMS 1.2.10

Sample

Groove Terminator with Goodwill — We Are You • Pocket (Poxymusic) — The Happy Song • Sony Pictures Digital loops

Toolkit

Linux

Adobe Acrobat Reader 5.0.9 • ATI Proprietary Linux Driver 3.12.0 • cdrtools 2.01 • Firestarter 0.9.3 • Gaim 0.82 • gFTP 2.0.17 • GIMP 2.0.4 • Linux Kernel 2.6.8.1 • RAR for Linux 3.30 • RealPlayer 10 • WebMin 1.160 • XMMS 1.2.10

TextPipe Pro offer

TextPipe Pro is a powerful text-processing utility that combines 100+ conversion, translation and filtering operations on multiple text or binary files. Distributor Crystal Software is offering APC readers the latest version of TextPipe Pro for 20% off the RRP until 13 January, 2005.

ADVERTISERS' INDEX

Acer	4-5	Lexar	58
ACO	126	LG	25
ADO	128	Microgram	69
Altach	129, 131	National Communications	127
Anyware	134-135	NavMan	75
Apple	2-3	Optus	105-107
Astralat	137	OTC	139, 141
ASUS	87, 89, 91, 93, 95	PC Range	83
ATI	124-125	Pioneer	47
Australian IT	11	Power Tech	140
Big Ben Computers	138	ProLac	108, 130
Bluechip IT	51	Ricoh	30-31
Brother	45	Sony	41
Canon	61, OBC	TEG Computers	149
Capax	115	Toshiba	54-55
Com-Tek	133	TPG	104
Creative Labs	IBC	Universal Enterprises	53
Dell	IFC, 1	University of Queensland	73
Epson	32	USB Tech	136
Fujitsu	35	Verbatim	76
Harris Technology	Insert	Viewsonic	43
Hewlett-Packard	49	xicg	19
IBM	12, 23		
Impact Systems	122-123		
I-Tech International	132		
Lanier	99		
LASER	119		



We call it personal computing, but over the last two decades the PC has primarily changed the world of work. These days, hardly any workplaces are without networked PCs, business software and a bevy of attached peripherals. Increasing productivity in the workplace is the overwhelming achievement of the first generation of APC readers. Some created the products, but the majority used them and spread the word to others when they saw value. They were part of the generation that changed the way businesses operate.

But what about the next generation of APC readers? How will the sons and daughters of the first PC enthusiasts make their mark with personal computing technology?

They'll use the PC to change the world outside of work. They'll change the way we consume entertainment at home as profoundly as their parents changed the workplace.

Just as the PC got the first generation of users excited about the power of spreadsheets, desktop publishing and customer databases, today's computer-savvy teenagers and twentysomethings are getting excited about how a PC lets them change the way they consume music, TV, movies and how they communicate with each other.

I've seen it first hand with my son, who until recently never showed the slightest interest in using a PC for anything beyond writing school essays. I always made sure his computer was stocked with the most exciting new games and computer gear — the latest soundcards, video cards and TV tuners, the biggest monitors and so on. I even tried to show him how cool it was to have his own Web site (created by me). But somehow, it never got him excited.

The turning point was his discovery of digital music. Until then, he'd listened to music through his disc-based Walkman. Suddenly, with a broadband-connected computer, he could find the songs he really wanted, arrange them in different playlists, upload them to his iPod, and generally consume music in exactly the way his particular tastes dictated.

But that was just the beginning: he now remixes songs using mixing programs and creates his own tunes. He has learnt how to "spin" music files like a DJ and shares files with his friends via instant messaging. These days, I can't get him off the computer.

He has experienced the same magic of empowerment that I felt years ago, when

I discovered that it was possible to remotely log into a computer in the US and view its contents. At the time, I felt like I was being teleported across the Pacific. It was an epiphany that showed me what computers could do, and I was forever hooked.

This month's cover story (feature on page 77 and music files and software on the cover CD set) takes you through the essentials of the personal computer's incredible impact on the way we consume music. The feature starts with a review of locally-based legal music services, because they're actually improving to the point where they are no longer a distant, poor alternative to peer-to-peer music networks.

We also look at alternatives to Apple's all-conquering iPod music player. The iPod may still have the most street cred thanks to Apple's great marketing, but there are some alternatives that are technically superior. You can even win one of these, a Creative Zen player, in our cover CD competition.

Also on the cover CD set, we've included a bonanza of music files that you can listen to or remix. One of Australia's hottest dance

music artists, Groove Terminator, has provided a song with its various components split into different WAV files for remixing. Have a go — you can add new sounds from a big selection of

How will the children of the first PC enthusiasts make their mark?

loops on the disc, all picked specially for APC by Sony Music. The winner will receive radio airplay and distribution through a future APC cover CD.

If the twentysomethings are off changing how we consume and generate entertainment in the home, what are the thirtysomethings and above doing? Speaking for myself, I'm excited about the possibilities of Voice over IP. It's now reached the stage where it's available and easily implemented in both businesses and homes.

Our focus on VoIP (feature on page 100, software on CD) takes you through everything you need to set up a connection and could save you thousands of dollars in phone bills. A feature on VoIP was discussed earlier this year, but we've waited until the technology was mature enough to be easily implemented by our readers.

That's what I love about the personal computer. Two and a half decades since PCs arrived and they're still fundamentally changing the ways in which we do things.

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Need to Know

News, views and analysis from the IT world

Linux

No let-up for Linux

Could a black book of software secrets sink the open source dream?

It seems the biggest question facing Linux users is no longer whether they can conquer the desktop PC, but whose toes they might step on while doing so.

Legal battles over Linux have shifted beyond its Unix roots to claims that the free OS kernel may breach 27 patents held by Microsoft. The claims are contained in a report by an open source group identifying 283 patents potentially damaging to Linux, but not yet challenged in any court.

Around one third of the 283 patents are owned by companies perceived as Linux-friendly, such as IBM and Oracle. IBM has stated that it has no plans to enforce its patents against Linux, though it has stopped short of a written guarantee.

However, this hasn't comforted a Linux

Microsoft has made no secret of its increased interest in exploiting the patent system and has outlined plans to file more than 3,000 patents this year. A controversial message circulated among HP executives in 2002 said Microsoft was going to use the law to "shut down" open source software.

One obvious question is why lawsuits aren't already proceeding if Microsoft is so keen to utilise the patent process to protect what it perceives to be its property.

Perens believes this is primarily a question of timing. "None have been brought so far — why? Because [Microsoft] doesn't want to make bad news for its own efforts to increase software patenting in Europe and Australia and other countries. It's not going to bring patent suits until

it has a global law."

Such an outcome may not take long. As part of Free Trade Agreement between Australia and the US, Australian software

Uncertainty over the legality of open source might impact adoption

community which is still recovering from

legal threats by SCO over code allegedly copied from Unix. Some fear that Microsoft and other companies might take a similar stance. "Unfortunately, we've seen an extreme amount of complacency — a sort of head in the sand attitude — within our own community," open source development pioneer Bruce Perens warned at August's LinuxWorld conference in San Francisco. "[Microsoft] is filling up to 30 patents a day. I don't believe it's that meek about what people will or won't let it do."

The signs point to an increasingly troubled path for Linux, said Perens. "If we continue towards a regime of global software patenting that's as bad as the US, Linux and open source are toast."

"These things are going to hurt us because they're government-granted patents, and until we can prove they're not valid, they are a licence to sue."

patenting laws will be harmonised with those in the US. It's a situation causing concern among some local developers.

Deals such as the FTA have the potential to scare many businesses away from using Linux, and advocates argue could even spell the end of open source development.

"Most Australian developers have probably built products which 'infringe' on US software patents," Open Source Industry Australia argued in a statement on the FTA. "Introducing a system which makes it simpler for these patent holders to bring such legal hooks into Australia is very damaging to the local industry."

Enforcement of software patents isn't just a problem for open source developers. Commercial developers routinely end up licensing patented technologies, either



Code woes: the Linux case file is filling up as attention shifts away from its Unix roots.

Also in Need to Know:

17 Exchange Mark Stevens

Most popular home firewalls just aren't secure enough, according to the chief strategy officer of network security vendor WatchGuard Technologies.

18 Feature .Net for Linux

It's been slated as one of the most significant Linux projects in years, but can Mono really provide a Linux equivalent to .NET?

22 Dispatch

The Internet trial of the decade starts this month and Sharman's head honcho is laced up for some head kicking.

24 Opinion

Dan Warne asks if we have virus writers to thank for getting Microsoft to open up portions of its source code archives. Bucking the trend set by its rivals, don't hold your breath waiting for Windows or Office to get smaller says Mary Jo Foley.

26 Watchdog

Exceedingly bad customer service or miscommunication?

28 Epinions

APC readers have their say.

Photo credit: Elliot Marks, S&P



Piracy? Not here

While the peer-to-peer world goes feral over illegal downloads, software makers have launched an ambitious concept: a file sharing network for law-abiding citizens only.

It's a cute idea — especially the part that pretends users won't immediately go off in search of complete strangers' 10GB MP3 hoards.

In the case of file-share software *CleverCactus*, this is partly true because there are no strangers. As creator Diego Doval explained, you already know everyone, and they already know you. "The network you create is equivalent to the one you'd create with Windows Networking," he said. While there's no chewing up your 10GB broadband allowance on dodgy Top 40 downloads, this doesn't account for "sharing" illegal music with friends.

Other new network software never to be used for piracy includes *Shinkuro*, *Spike* and *FolderShare*.

Beyond Wi-Fi

Can notebooks keep up with emerging wireless technology?

PC manufacturers will be forced to add extra RF chips and antennae to their products to accommodate new wireless standards promising to crank speeds up to 500Mbit/s. The emergence of 802.15 ultra-wideband, 802.16 (WiMAX) and "ZigBee" are further complicating matters for hardware vendors.

"There will certainly be a need for more complex chipsets," said Pioneer Computers Australia product manager Jeff Li. "However, I think we will be able to continue to integrate the antennae into the body of notebook computers as we do now."

Leading the pack is the 802.11n specification, which could be on the market by early next year. Speeds greater than 500Mbit/s are being discussed.

All vendors are stressing that 802.11n will be backward compatible with both g- and b-based devices. Nevertheless, achieving greater speeds will mean an overhaul for wireless devices. As Nortel's Anthony Buckton explained, n-based devices send data over multiple paths within a single channel. "It makes things a lot more complex but delivers a significant increase in speed," he said.

The technique, called Multiple Input, Multiple Output (MIMO), uses two antennae at each end of the link to handle data streams within a standard

WiMAX: wide area LANs up to 50km, up to 70Mbit/s.

Wireless

ZigBee: short range, finding its niche in home automation.

802.11n: Wi-Fi standard, more than 500Mbit/s.

UWB (ultra-wideband): short range, up to 1Gbit/s, could replace USB.



Next-gen wireless

20MHz frequency band. By extending the technique to four antennae and a 40MHz band, speeds higher than 500Mbit/s are possible.

The emergence of a range of performance enhancements to the existing 802.11g standard is making waves. One example is *SpeedBooster*, from Cisco subsidiary Linksys, which is claimed to improve Wi-Fi network performance by as much as 35%.

For chip makers, ensuring future chipsets can cope with a growing variety of wireless systems is increasingly challenging. Intel has moved to those down expectation of a chip that can be tuned into different wireless protocols as required.

lan Grayson

No let-up for Linux



willingly or to avoid expensive lawsuits.

Open source developers are

potentially more vulnerable as their code can be reviewed by businesses seeking to enforce a patent claim. Uncertainty over the legality of open source might also affect adoption, a goal which some in the Linux community argue is the main purpose of the patents.

"It will mean the concept of backyard software development will be killed off," said Ronald Skeoch, managing director of small Sydney software development company Muli Management. He estimates that Muli could

face up to 200 software patent claims on its payroll and business software if US patent laws came into effect locally. "The community has never been involved [in the patent process] and doesn't understand where it is taking us," Skeoch added.

Previous attempts to diffuse legal disputes over Linux have seen programmers offer to remove offending code in the event of conflict. A new tracking procedure also makes it easier to find the coders who contribute to various parts of the Linux kernel.

In any event, Linux kernel developers are already enhancing their legal resources in anticipation of more lawsuits. They can now pay US\$250 per year to a company called Open Source Risk Management, which offers legal protection if they are named in court. In late August, Open Source Development Labs (OSDL), which now employs Linux creator Linus Torvalds, appointed its first full-time in-house legal counsel.

"Linux and I have a bet," said Jeremy Allison, co-creator of the Samba Linux application. "I think a big open source project will get sued this year for patent violations. He says it's going to be next year."

Angus Kidman

Additional reporting by William Maher

Copied code?

Patent concerns over Linux are just part of a string of code copying controversies.

- 1990s — Unisys enforces patent on the graphics software that creates GIF images.
- 1999 — Amazon.com granted a patent on "one-click shopping" online.
- 2002 — British Telecom loses a case claiming a patent on hyperlinking.
- 2004 — Microsoft granted patent on double-clicking (handheld devices only).
- 2004 — Google in court over search ad patents held by Yahoo-owned Overture.

Inside info

■ Linux protection
www.osriskmanagement.com

MP3

Microsoft's iPod assault

Format incompatibilities are setting the computer giants on a collision course.

Microsoft has unveiled a massive marketing campaign reminiscent of "Intel Inside" for its iPod-challenging portable music devices.

A new logo with the slogan "Plays for sure" will identify music hardware and software in Microsoft's Windows Media Audio (WMA) format. Microsoft has also unveiled a beta version of an MSN Music site to compete with iTunes.

However, despite the feel-good tagline, incompatibilities continue to separate the Microsoft and Apple digital music camps. The closed-door approach, which prevents iPod users from playing MP3 or other formats has placed Apple on a collision course with those wanting to make music available to all devices, regardless of brand. Legal download music sites in Australia say they could sell music in the iPod-compatible AAC format, but they need access to Apple's copy protection technology.

"We have licenses [to distribute music] in AAC, but we need [Apple's] FairPlay DRM technology to leverage that," said Dominic Caroso, CEO of Destra, which provides online music downloads for HMV, Sanity and others.

After repeated attempts to sign a deal with Apple, the makers of RealPlayer reverse-engineered the file format. It now sells music in a format that can be played on the iPod as well as on PCs using RealPlayer software.

Apple responded that it was "stunned that RealNetworks has adopted the tactics and ethics of a hacker to break into the iPod," and warned consumers that Real's file format was likely to stop working on iPods after a future firmware revision.

But will incompatibility issues dent the iPod's phenomenal success in the future? According

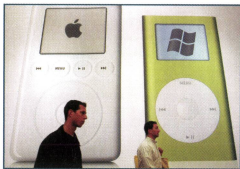


Image digitally altered

Plays for Sure?: That all depends on the logo.

to GFK Australia, sales of digital music players doubled in July 2004, from around 17,000 units a month to more than 30,000, with Apple's iPod holding a solid lead. However, some argue that this could change. "One day someone other than Apple will come up with a 'hotter' player and the market will move on from iPod and iTunes," said BigPond Music chief Justin Milne.

Apple remains tight-lipped about the Australian iTunes Music Store launch, but sources close to the company said it could be in late October.

By then, the site will have to compete against a groundswell of Microsoft activity. The company has a ready-made audience of 180 million Windows users who will be automatically prompted to update to Windows Media Player 10.

"Microsoft and any other competitors will do anything they can to destabilize the grip that Apple has on the digital download market with the iPod," said music industry commentator and consultant to Apple, Phil Tripp.

Dan Warne

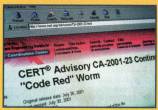
Is it legal...

... to write "proof of concept" viruses?

The Cabir mobile phone virus was one of many "proof of concept" viruses created by "researchers". The idea is to demonstrate security holes, warning software vendors to issue patches before "real" virus writers attack.

Publishing the code of a proof of concept virus is not illegal, as under Australian law the publisher must intend to commit a computer crime. However, if the security hole has been exploited through analysis of improperly obtained code, vigilante developers may be guilty of an offence through breach of confidence. You'll get headlines, but for the wrong reasons.

Disclaimer: this does not constitute legal advice. Check with the appropriate legal authorities if an issue specifically concerns you.



Worst tech demo

We see a lot of them, but we weren't sure how to react when we picked up the phone recently to hear the following: "Hell... this is... I... you... about... VoIP."

The APC journalist put two and two together and asked whether the caller was using the Internet-based phone system. "Yes!" came the excited reply. After telling the caller he was breaking up, we got back a frank explanation: "Oh I know exactly why it's doing that. It's because I'm sending email at the same time." We've decided to give VoIP another chance. For an in-depth guide to where the technology is heading and how much you can save using VoIP, turn to page 100.

William Maher

Which music format?

Feature	Microsoft WMA	Apple FairPlay AAC
Copy protection?	Yes	Yes
Optimum bit rate	128Kbit/s	128Kbit/s
Works with	Most digital music players except iPod. Includes Creative, JNC and iRiver	iPod and iTunes/RealPlayer 10.5 for Mac and PC
Limits burns?	Yes. BigPond and Destra, for instance, let you burn a song to a CD three times	Seven burns of a playlist, unlimited burns if songs rearranged into different playlists
Compatible online music stores	Most, including NineMSN Music, BigPond Music, Destra	iTunes and RealRhapsody
Limits number of computers?	Yes. Companies such as BigPond and Destra only allow you to listen on one computer	Five machines



Quote file

**“There’s
no rewrite
going on
here”**

Gates downplays changes made to Longhorn to meet a 2006 delivery date, including scaling back its WinFS desktop search plans.

(Source: News.com)

Hard drive hacking

Some 7,200rpm drives can be souped up to operate at 10,000rpm.

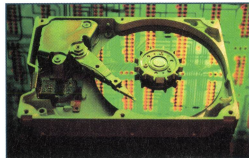
Seagate is the latest manufacturer to join the ranks of those offering “upgraded” models identical to their predecessors, with different firmware.

The new 160GB Seagate Barracuda 7200.7 SATA drive features Native Command Queuing (NCQ), which writes data faster because the head doesn’t skip back and forth across the drive platter.

NCQ technology allows a 7,200rpm drive to operate as fast as a 10,000rpm drive under some circumstances. (APC Labs will report real life results to compare with Seagate’s claim next month.)

Seagate hasn’t made hard drive firmware for its consumer level drives available on its Web site in the past, and a spokesperson for the company couldn’t confirm whether upgrades would be available for the older (hardware identical) drive.

DVD enthusiasts have been extracting firmware from newer drives and flashing it into older models to give their drives enhanced speed and functionality (APC October, page 84). By downloading and installing firmware files, it’s possible to make single layer 4.7GB drives capable of burning to 8.5GB Double Layer discs, though this involves the risk of rendering the drive inoperable.



Rev counter: is that smoke coming from your spindle?

It’s likely that enterprising Seagate owners will soon find a way to extract the firmware from the new NCQ-capable Seagate Barracuda 7200.7 (part number ST3160827AS) in order to install it into the existing 7200.7 model (part ST3160023AS). The new model is expected to be released this month.

All isn’t as it seems when it comes to DVD burning times either. Enthusiast site CDFreaks.com (<http://cdfreaks.com>) reports that some 12x drives (Plextor Px712A) actually burn a disc faster than 16x drives (Pioneer DVR-108). The reason is different burning modes, as explained in “Extreme DVD burn” (APC October, page 82).

Dan Warne

Data dump

\$16,000

Price in US dollars demanded online by a hacker group claiming to be offering the source code from security software. Secret source code has become prize bounty for hackers of late, with Microsoft, Cisco and Roxio among the victims in the last year. (Source: News.com)

Songs RealNetworks claims to offer online

Number claimed to be available on iTunes

630,000

More than 1 million

Average “survival time” in 2003 for unprotected PCs before they are infected by viruses

PC survival time in 2004

40 minutes

17 minutes

(Source: Internet Storm Center)

Number of retail Telstra broadband subscribers at end of last financial year

Proportion of Sydney ADSL users affected by outage in August

424,000

10%

(Source: Telstra)

(Source: CDN)

Number of Hotmail users in Australia

Number of MSN Instant Messenger users

4.1 million

2.9 million

(Source: CDN)

Exchange: Mark Stevens

Is your firewall letting you down?

According to Mark Stevens, chief strategy officer of network security vendor WatchGuard Technologies, most home firewall products aren't secure enough. APC asked what's wrong with the technology, and how it can be fixed.

What's wrong with firewalls?

Basic packet filtering is not very intelligent. In regular packet filtering you can't actually control who calls who.

How do hackers get in?

You can run any application over any port you like. The port is simply a connection. There are standard accepted uses — port 80 is usually http, but I could run email over port 80. That's kind of a nuance that hackers use to get through firewalls.

Can't we choose what to let in and out?

Typically with a personal firewall, a notice will pop up and say, "Your computer is attempting an outbound connection on port x." A lot of people just click "OK", and that's where the danger is.

Can firewalls operate smarter?

The next level is looking at the traffic itself. In stateful packet filtering, I might only want to allow outbound connections, I don't want anybody connecting back in. That's a big difference.

With TCP hijacking, a hacker can try and take over an existing connection and inject their own traffic. Stateful firewalls can detect any attempt to break into an existing connection.

Many home firewalls don't block outbound connections. Does that matter?

The easiest thing to do at the personal firewall level is to stop other people connecting to your PC. That's very useful but it's not 100% [effective]. If you have a network printer, you would like it to work. But if you've got spyware on your machine, you don't want it to connect out. The trick is knowing what's good and what's not.

What's the next trend in firewall technology?

An application layer firewall can say, "I understand you're going to be using http, but you told me you didn't want any ActiveX, so I'm going to throw that away." A stateful packet filter firewall can't do that. Even a personal firewall which is stateful isn't going to be able to protect you against that.

What changes would you make to personal firewalls like the one in Windows XP?

Not only can they look at what's going in and out of the machine, they can also see what processes are running on the machine. It's an extra layer of protection where you can kill processes.

How could hackers fight back?

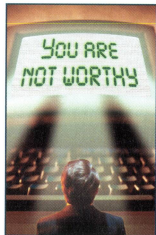
Hackers will try and masquerade as legitimate processes, so that they look like something else.

Is this happening?

Say you get some spyware or a virus on your machine. The next phase is that spyware will phone home, and say "you need to replace yourself with this other program". That's actually becoming a more widespread technique.

Mark Stevens spoke to William Maher

Interview



Are supercomputers being designed to taunt ordinary PC users? The new Orion DS-96 workstation is capable of a mind-bending 150Gigaflops, or 150 billion calculations per second, and has enough storage for up to 9.6 trillion bytes of data (as reported by Wired News). No CPU speed is too ridiculous, no processor name too weird, as you can see below.

This ain't Intel

Nothing says "elite" like topping off a 10Gigaflop machine with a bizarre CPU name. Until recently that title went to Transmeta's cringe-inducing Efficeon, but that all that changed under the impenetrable geek logic of Japanese chip designers Riken. Its new CPU name? The "MDGrape 3".

The top 500

Let's not kid ourselves, this list of the world's fastest computers (check it out at www.top500.org) is "mine's bigger than yours" syndrome writ large. And why not? When you've spent close to US\$90 million on a Cray box dubbed "Red Storm", you really want someone to know about it.

Suuuure it's an Apple

Sticking a big ugly "X" on a notebook may not be as crazy as it sounds.

Passing yourself off as Apple's bastard child is in vogue, as this split personality notebook shows. Universal Enterprises is clearly so impressed with Apple's style that it decided to hell with it, and stuck a big Apple-style "X" on the cover.

But Universal Enterprises isn't the only culprit. MP3 makers, for example, have been ripping off the iPod with increasing cheek, right down to the circular touch dial and smooth white finish. There's even a 4GB MP3 player called the Podi.

William Maher



Personality split: too many beers around the design table?



.NET for Linux

It's been slated as one of the most significant Linux projects in years, but can Mono really succeed in providing an open source equivalent to Microsoft's much-hyped .NET? David Braue separates fact from fiction.

Inside info

■ Mono Project home page

www.mono-project.com

■ *Mono: A Developer's Notebook* by Edd Dumbill and Niel Bornstein (O'Reilly: ISBN 0596007922)

■ *Mono Kick Start* by Hans-Juergen Schoenig and Ewald Geschwinde (SAMS: ISBN 0672325799)

■ Novell Forge open source community <http://forge.novell.com>

■ "The Long Reply," Founder Miguel de Icaza's open letter about what Mono is and isn't: <http://mail.gnome.org/archives/gnome-hackers/2002-February/msg00031.html>

If imitation is the sincerest form of flattery, Microsoft has a lot to be happy about. Although sceptics panned the .NET framework as the company's way of owning the emerging field of Web services, years of developer hand-holding and executive "education" have helped it become well accepted.

In fact, developers like .NET so much that several hundred of them have spent much of the past three years cloning it. Called to action by the initiative of developer Miguel de Icaza in 2001, their efforts to replicate .NET's functionality became reality this year with the 1.0 launch of Mono. Promising cross-platform compatibility with .NET, Mono is a comprehensive application framework that could, if its proponents play their cards right, become Microsoft's worst nightmare.

CHASING MICROSOFT

Microsoft's .NET strategy has always been based on customer lock-in. By supporting the technology only in its Windows environments, Microsoft has successfully positioned .NET — and its intimate links with open Web services standards including SOAP, XML and UDDI — as a Windows value-add. Microsoft's only concession to other operating systems has been its support for those Web services

standards as a way of standardising information exchange between applications and platforms.

Although broad approval of .NET technologies such as the Common Language Infrastructure (CLI) helped Microsoft paint itself as contributing to the global development community, it also opened the company up to imitation. Microsoft was effectively asking for Mono to happen, and de Icaza's team wasted no time in taking up the challenge.

The final product could redefine the way apps are built in alternative environments. While Microsoft's legacy of successful Integrated Development Environments (IDEs) has helped it retain the mantle of development tools leader for years, these tools have only been available on Windows. This is a major reason why even Microsoft's critics continue to use tools like Visual Basic and Visual Studio.NET. Mono, on the other hand, offers its own open source IDE, debugger and documentation browser — all tools that mirror Microsoft tools' functionality in an open design.

CODER'S DELIGHT

Mono isn't a product, it's a technology toolkit for developers. Like .NET (and Sun Microsystems' competing J2EE), Mono incorporates a compiler that converts source code into bytecode, which is then run on a virtual machine called the Common Language Runtime (CLR). This is complemented by a growing set of libraries offering common functions such as GUI interfaces and data handling routines as well as .NET-specific features like ASP.NET and ADO.NET.

The primary development language for Mono is C#, which Microsoft developed specifically for .NET, but compilers for everything from C and Visual Basic to Python are already at various stages of development.

There's one big difference between Mono and .NET, however. While .NET is only available on servers running Windows, Mono is an open source project that can be implemented on any type of server environment. That means applications written using Mono can run seamlessly on Linux, Sun Solaris, Mac OS X and even OS/390-compatible mainframes. Developers can enjoy the strengths of C# — hailed as more productive and straightforward than languages like C++ and Visual Basic — while building apps that run smoothly in all sorts of environments.

"C# is pretty quick to develop in," says Edd Dumbill, a UK-based developer who recently co-wrote *Mono: A Developer's Notebook*, one of the first books to discuss the ins and outs of Mono. "It provides the benefits of a statically

typed language and the constructs for organising source code, and provides a lot more for free, especially in terms of its object model."

Dumbill began using Mono two years ago and found it quite easy to transfer his earlier expertise into the new environment. More telling, however, was the fact that he and co-author Niel Bornstein — an experienced .NET programmer — had no trouble relating their experiences and writing Mono-compatible code for the book. This fact both reinforced Dumbill's belief in C#'s value and confirmed the viability of Mono as a vehicle for .NET compatibility.

MATCHING .NET

Because it has been built under open source, Mono is naturally being positioned as a complement to Linux, which has become the de facto alternative to Windows in both the corporate and developer environments. It features functions such as the Gtk# toolkit — a series of .NET bindings included in Mono — as well as libraries for GNOME to allow development of customised interfaces.

As with any attempt to duplicate the functionality of a commercial product, Mono's success will depend on its ability to keep up with new developments in .NET. Mono 1.0 claims feature parity with the .NET Framework 1.1, although features such as Windows.Forms, Directory.Services, Enterprise Services and JScript are still less mature than the core framework components.

A potential spanner in the works will be Microsoft's upcoming release of Whidbey (see review on page 38), which will next year emerge as version 2.0 of .NET. Whidbey will

include upgrades to ASP.NET, changes to compiler and class libraries, the debut of standards such as XQuery and XPath, new controls on Windows.Forms and the ObjectSpaces API to simplify database access.

Whidbey offers the Mono team a new target to work towards, with many of these features already planned for incorporation into Mono 1.2, an interim update due out by the end of the year. Full compatibility with Whidbey is expected with the release of Mono 2.0 around the second quarter of 2005.

But Whidbey isn't the only challenge that Mono faces. By 2006, WinFX — Longhorn's .NET stack — is due and is set to include a broad palette of features such as the WinFS file system, Indigo communications stack and Avalon GUI. Just how WinFX technologies will be implemented in Mono is still being decided; inevitably, the programmers will add features

as they're revealed in the lead up to Longhorn's release.

Although the battle to compete with Whidbey is the Mono team's next big technical

challenge, the project's ongoing support and growing technical acumen raises a very important long-term question: will Mono continue tagging along behind .NET, or will its developers begin taking the initiative to push Mono in new directions that Microsoft has yet to explore?

WHO'S USING MONO?

Whether Mono eventually becomes a popular player in the .NET space will largely depend on its success among the business community, where support for its capabilities will be essential to its long-term viability. As with many open source projects, visibility will be a serious issue: even supremely elegant

Platform face-off

■ Mono

Mono is an open source version of .NET that can run on any operating system. It is compatible with C# and the Common Language Infrastructure (CLI) standards, which Microsoft developed for .NET. Mono developers can program using the popular C# and other programming languages, then compile applications that run on any platform with a Mono Common Language Runtime (CLR). Additional libraries provide functions specific to each operating system, giving Mono-based applications the functionality as well as the look and feel of the target platform.



■ .NET

Microsoft's application framework, which lets developers build applications that communicate across the Internet or intranets. It uses open "Web services" standards such as XML and SOAP so that its applications can communicate with other systems. It also provides hooks into Windows, allowing developers to build full Windows applications that link Web services with the Windows environment.

The .NET Framework is only available on Windows systems, as are popular .NET-enabled development tools such as Microsoft Visual Studio.NET. Microsoft invented the C# programming language for .NET, but Visual Studio.NET supports other languages.



Mono's success will depend on its ability to keep up with developments in .NET

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technical solutions will need strong support to offset the momentum of Microsoft's marketing machine, which has spent more than US\$250 million promoting Windows Server 2003 alone.

By contrast, it took years of effort and the support of legitimate companies like IBM and HP to build distros such as Red Hat and Debian into brands that business customers trust. In this respect, Mono has found a surprisingly strong ally in Novell, which last year purchased Ximian, the company that, through de Icaza, had maintained initial stewardship over the Mono project. Earlier this year, Novell strengthened its move into open source with the purchase of Linux mindshare leader SuSE Linux.

A NOVELL IDEA

Although Novell doesn't actually own Mono, it has taken stewardship of the project and will be using Mono technologies extensively within its product line. The company's first deliverable is Folder 3, an open source file sharing and synchronisation tool written entirely in Mono. An enterprise version will add better security.

Mono's highest profile gig, however, will be its integration as a core element of Novell's Linux Desktop, due before the end of this year.

By incorporating Mono elements into the rejigged SuSE desktop, Novell will be providing developers with a complete Linux-based, .NET 1.1-compatible environment that will permit developers to write C# enterprise applications that are hosted on a broad range of operating systems. This will be a significant differentiator for developers, many of whom will consider Novell's "development platform in a box" to be a welcome improvement over Microsoft's all-or-nothing Windows proposition.

Easy access to cross-platform capabilities remains an ideal within the development community, says Bill Tinker, immediate past president of the Australian Developers Network. Tinker, who now develops applications for corporate customers through his Melbourne company Aries Software, has yet to use Mono, but says he likes the idea — as long as compatibility proves up to scratch.

"On the one hand, I'm pleased alternative .NET runtime engines are being built," he says.

"Microsoft isn't interested in porting its applications onto other platforms, so if someone else can do that, it's a win-win situation. The more platforms there are to move source code across, the more development there will be. But I've seen things in the past that claimed to be 100% compatible [and weren't]. It should be a zero effort transition, but there are such vast differences between platforms that it's very hard to imagine how one runtime environment can [embody] all the options available."

Developers on the Macintosh platform would benefit significantly from Mono, since Mac OS X has struggled to attract commercial developers.

The more platforms there are... the more development there will be

Mono, an extremely popular download through Apple's Web site, should allow Windows-built .NET apps to be run on Mac OS X virtually unchanged. An independent project, Cocoa#, is building a two-way bridge between Mono and Mac OS X's Cocoa library of object-oriented development components to produce a two-way interface that tightly integrates them both. This will allow Mono-based applications to have a Mac look and feel, further strengthening Mono's credentials.

PORTING POSSIBILITIES

Other commercial software companies are watching Mono with interest. Longtime desktop publishing giant Quark, for instance, is rumoured to be among the companies eyeing Mono. A favourite on both Windows and Macintosh, its flagship package will be maintained in two completely separate versions. A Mono port would let the company — and others facing similar issues — support both platforms from a single code base.

Similar benefits have attracted the attention of Computer Associates (CA), whose broad portfolio of software includes a growing proportion of open source code. CA made a significant contribution to the open source community with its Ingres database, and has recently taken an interest in open source tools.

CA's developers have borrowed code from the projects to integrate into its own products as well. For instance, CA's BrightStor document management project incorporates code from the open source Zope content management system and the open source Plone portal framework. CA is also embedding parts of the JBoss open source Java application server.

Interest is increasing in Mono within CA, says David Cook, product manager for the

Mono versus .NET

Emulating the work of thousands of Microsoft developers is no mean feat, and the coders behind Mono are only part of the way there. Mono's core modules and tools are reportedly rock solid, but some Mono features are in a state of constant flux while some of the more esoteric functions of .NET have yet to be supported. This will be the biggest issue for developers looking to move existing .NET-based applications onto Linux via Mono; those writing to Mono's base specs shouldn't notice any problems building portable code. Below are some of the major .NET elements you'll find in Mono.



Feature	.NET	Mono
Integrated development environment with virtual machine, just-in-time compiler and debugger	Visual Studio.NET	MonoDevelop
Operating system support	Windows	Windows, Red Hat Linux, SuSE Linux, Mac OS X (downloadable packages), others by recompiling source
Web services support	Yes	Yes, through System.Web.Services element
Directory Services	Designed for MS Active Directory	System.DirectoryServices
Database	Designed for MS SQL Server	System.Data and Mono providers
Java integration	No	Through IKVM
GUI support	Windows	Windows, GNOME, Mac OS X, others
System management features	System.Management, System.Drawing.Design	Not implemented
Web-database integration	ASP.NET	WebForms, Web Services supported; WSE1/WSE2 under way
Development language support	C# and others through Visual Studio.NET	C# integrated, others through additional open source modules

company's AllFusion development tools range. Part of Cook's job involves evaluation of open source tools. He's generally bullish about the prospects for a system like Mono, but says it could face an uphill battle gaining support within brand-sensitive businesses.

"We see Mono as being not another runner in the J2EE-.NET race, but an extension [for cross-platform capabilities]. If our customers ask for it, we will absolutely support it."

A MONO FUTURE?

Although it presents a significant threat to Microsoft's Windows.NET lock-in, Mono isn't all bad news for the company. Mono actually supports the .NET message: by enabling the creation of a .NET-compatible environment on alternative OSes, Mono will help .NET compete against J2EE in Unix environments where the latter environment has enjoyed free reign.

Companies recognise Windows as an inevitable part of the enterprise environment,

and few would be likely to implement Mono on a Windows Server 2003 system when it already has .NET built in. However, many organisations remaining sceptical of .NET may finally be happy to explore its potential knowing it can be run on Unix as well as Windows.

This shift will also be helped by the fact that skilled in-house VB and C# programmers can use their skills to build applications for other environments. They could use Mono to build under Windows, Linux or other platforms, and then to deploy the application on the most appropriate server platform.

Corporate use of Mono is likely to remain extremely low until its compatibility is proven. However, as happened with Linux and Samba, its free availability could well lead to point implementations of the technology, where in-house development teams use the technology to move less critical .NET apps onto alternative platforms. By the time Mono reaches the boardroom level, many companies will

likely be using it for a variety of purposes.

Achieving this critical mass will require lots of work. Open source's tendency toward continual incremental improvement makes Mono a moving target for developers, who see platform stability over time as a major issue. As a result, its developers will need to carefully stagger new releases to minimise upgrade pain and maintain backward compatibility.

Perhaps the most important factor at this point, however, is spreading the word. And that's an area where the effective endorsement of a well-known company such as Novell could turn out to be Mono's biggest asset.

"As technologists, it's great for us to have access to this sort of technology," says CA's David Cook. "But until the business asks the IT department for this level of support, we're not going to see it in the enterprise space. Mono may be able to play technically, but it's in the hearts and minds of businesses that this battle is going to be won." www.coding.com

The new Linux apps — some early examples of Linux applications built with Mono

DASHBOARD

A pet project of onetime Ximian developer Nat Friedman, Dashboard is a tool that scans what you type for relevance to a variety of other sources. For instance, writing an email that mentions the phrase "my holiday" might pull up pictures from your last holiday, as well as a table showing current airfares to Tahiti or Tanzania.

Applications supporting Dashboard send it "clue packets" indexed into databases that are continually matched with known information.

Online: www.nat.org/dashboard

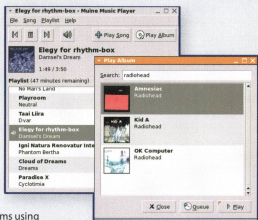


MUINE

This GNOME-based music player supports MP3, Ogg Vorbis and FLAC files and has been engineered to support a range of advanced song matching features and ReplayGain volume matching, as well as the rich metadata features of ID3v2.

Muine is available as a TAR distribution file and is capable of being recompiled for other platforms using a variety of open source libraries.

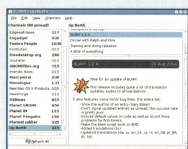
Online: <http://muine.gooyeelix.org>



BLAM!

There are thousands of RSS readers on the market, but Blam! was the first to be built using Mono. Designed by Swedish developer Mikael Hallendal, Blam! supports all the usual RSS features, including image caching asynchronous image reading, printing and so on. "I'm really impressed by how fast I can develop apps with Mono/Gtk#, " Hallendal reported as the product rapidly reached its first release. "After less than a week of development it's starting to feel pretty close to ready, and I mean, 1.0-ready."

Online: <http://micke.hallendal.net>



NOVELL IFOLDER

By combining file synchronisation with encryption, Novell used Mono to design a means of sharing files between work and home without resorting to email and complex VPN tunnels.

With iFolder, you save your files locally and the application syncs them with all the other machines you use via a server. Better still, only changes to files are updated, saving bandwidth. Authentication is handled through eDirectory or LDAP.

Online: www.novell.com/products/ifolder/index.html





"It's a conspiracy!" wails Kazaa boss

The Internet trial of the decade starts this month, and Sharman's head honcho is refusing to go quietly.

Nikki Hemming doesn't get out of bed for less than 10 court hearings. In fact, the number was even further into double figures before the Kazaa boss finally put in her first appearance in Federal Court room 23C. She had good reason to finally turn up. After nine months of trying to get out of the whole shebang, Justice Wilcox finally announced that Sharman Networks would face trial this month.

Even before Justice Wilcox reached his decision, it was obvious that Hemming wasn't happy. She sat behind her vast legal team, rolling her eyes whenever the judge questioned her QC, ex-Federal Court judge Bob Ellicott, on matters relating to the case.

Everything from details about how the Kazaa system works to issues of who actually owns the Vanuatu-based company raised Hemming's ire. Dressed in a purple power suit and white skivvy, fingernails painted a deep red, she spent the hearing furiously scribbling notes for her row of solicitors, who then passed them to another row of barristers. But amid the racks of folders and towers of documents spread among the \$10,000-a-day QCs, it was hard to see if Hemming's notes ever made it to the front bench.

Ellicott and his army of legal eagles did their best to argue that it was unreasonable to expect Sharman to provide answers to many of the judge's queries. He argued that finding the documents required to answer these questions would take enormous time, if it were possible at all. He fought hard to portray Sharman as being cooperative during the discovery process, saying that the team had been "working seven days a week and after midnight" to meet the demands of the case.

Ellicott is the second QC to lead Sharman's defence, but he won't be the last. This was his final day representing the company. A third team starts this month.

Outside, flanked by her PR people, Hemming let me know in no uncertain terms what she thought of APC's coverage of the

case. She perceived it to be unfavourable, full of inaccuracies, and part of a wider media agenda against Sharman Networks. Coverage needed to be more "balanced", she argued.

It was a strangely contrary performance. She'd become aggressive, then pull back, as if not wanting to get the media offside. She even dangled an interview opportunity — if I was a good boy and wrote nice stuff, she'd bless me with her "message".

It was a tempting offer — Hemming has ducked APC scrutiny ever since Sharman was raided. She was once happy to use the media at every opportunity, but has since refused numerous interview requests from APC. In fact, Hemming hasn't wanted to

speak to anyone since the heat got turned up.

I had about a million questions for Hemming, so I suggested we go for coffee right then. Too busy. Besides, she wanted it in her office, with her PR people present. No problem. Tomorrow, perhaps? Flying overseas for two weeks. In two weeks, I offered. The answer was "maybe".

"I just want to make sure you have our message and you can do what you want with it," Hemming said. "But we'll both know that you have my story."

Hemming's feelings of being victimised by the media have been echoed by her legal team, who've complained in court about press coverage and demanded a gag order on all key players in the case.

Hemming has only issued one press release since then, trumpeting a US district court judgment that found Morpheus and Grokster not liable for copyright abuse on their networks. She couldn't resist trying to link the judgment to her case here, as though it were only a matter of time before Sharman too would be exonerated from these "spurious" allegations that it is stealing music. But ultimately it was futile. In green-lighting Morpheus and Grokster as legit, the US judge added: "The court offers no opinion in this Order as to Sharman's potential liability."

The Sharman group's five separate legal teams are pushing the recording industry in Australia hard. They want it to supply the names of copyright infringers, the titles of songs allegedly nicked, not to mention proof that the Kazaa system is beyond Sharman's control. To date, the local record industry has sent 279,000 "cease and desist" instant messages to Kazaa users, and all the IP addresses and songs downloaded from Kazaa supernodes have been tendered as evidence.

Kazaa's dense, complex EULA also reveals that the company tracks its users' every move with bundled spyware and sells a profile of their "interests and preferences" to advertisers. The Australian music industry has tendered this as further evidence that the company has tight control over the Kazaa system.

And the pressure keeps mounting. In a blow to Sharman's argument that Kazaa is the wholesome good guy fighting the record industry baddies, even heavyweight leftie and copyright law-hater Michael Moore was recently moved to make a veiled condemnation. "I don't have a problem with people downloading [*Fahrenheit 9/11*] and sharing it," he said, "as long as they're not trying to make a profit off my labour."

Moore knows it's not punters making money from file sharing.

A week after seeing Hemming outside court, her PR people gave me a date for an interview. Then, at 6.30pm the night before, my mobile phone rang. It was Hemming and she was wound up. She talked again about biased coverage and inaccuracies. I asked her to give me examples but she couldn't think of any. After our conversation, I sent Hemming an email inviting her to outline her complaints. Again, no response. She also challenged my access to her "counterpart CEOs" in the record industry: "You're not talking to [Sony CEO and ARIA chairman] Dennis Handlin every day."

I put it to a senior music industry source that Hemming is a counterpart with the heads of record companies. His view: "Yeah, like Al Capone was Elliot Ness's counterpart".

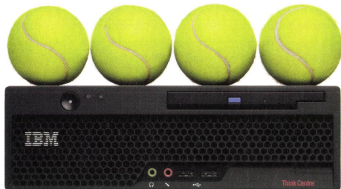
The trial starts November 29.

garthmontgomery@apcmag.com

For more about the Sharman/Kazaa case and APC's coverage, see www.apcmag.com/kazaa.

Hemming is a counterpart with the heads of record companies? Yeah, right

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Viral marketing for open source

Do we have virus writers to thank for getting Microsoft to open up portions of its code archives?

Microsoft would never have emulated open source and revealed some of its software code if virus writers hadn't made security Microsoft's number one PR nightmare.

Since Microsoft released XP three years ago, virus writers have been extremely successful in exploiting embarrassing security holes in Windows. Since then, the company's 57,000 employees have been unable to lock it down and the software giant's home page is now permanently plastered with step by step advice on how to secure your Windows system and guard against the latest security flaws.

It's reminiscent of the way tobacco companies started falling over themselves to be "open and honest" with customers by using their Web sites to hype the dangers of smoking as soon as litigation was in the air.

Now, in a move that has startled many industry observers, Microsoft has turned over code for some of its programs to the open source community.

Yes, you read that right. Redmond has posted source code for Windows template library components and Windows Installer XML toolkit on SourceForge (<http://sourceforge.net>). It's not considering handing over the code for Microsoft Office, mind you, but says it has definite plans to open source more programs in the future, starting with developer tools.

Pundits are betting that parts of Microsoft's Web server, IIS, which has been the constant target of the virus writing community, will be released as open source.

As surprising as the move is, the reality is that Microsoft doesn't have much choice in the matter. Virus writers have been "peer reviewing" Microsoft's software without even having access to the code — and publicising flaws in the worst possible way.

At the time of writing, Google was taking 30 seconds or longer to load because of a distributed denial of service caused by a virus exploiting a flaw in Windows PCs, which were directed to attack Google once infected.

Microsoft must know that one of the main reasons it has been targeted is because virus writers delight in disproving its argument that proprietary code provides improved stability, consistency and security.

By opening up its code archives, Microsoft will gain the benefits of true peer review. Now, the collective mind of the programming

community can pick up and fix inherent code problems quickly, before they hit the headlines.

Microsoft will also be able to claw back some credibility with programmers. It will certainly win the favour of more developers than it does by organising photo opportunities whenever a donation is made to charity by the Bill and Melinda Gates Foundation.

If this hypothesis sounds far-fetched, search Google for Microsoft employee Weblogs. You'll find Microsoft programmers are talking in folksy language about their latest ideas and developments. Can anyone seriously argue that Microsoft isn't trying to rebuild its street cred

within the tech community after years of being painted as a giant, monopolistic corporate bully? Just a few years ago, fortress Microsoft would never have permitted operational staffers to publish personal comments about their work at Redmond.

All this renewed engagement with the developer community will undoubtedly lead to more thoughtfully developed software and, ultimately, more reliable versions of Windows and its associated tools.

But it's not Microsoft we should be thanking. Despite making everyone's life hell at various points, virus writers have instigated a culture change in arguably the world's most powerful corporation. That's something that courts, governments and the media, anywhere in the world, have been unable to do.

Mary Jo Foley



Microsoft's future: fat or thin?

Bucking the trend set by its rivals, don't hold your breath waiting for Windows or Office to get smaller.



The thin client's back. IBM's talking it up with Workplace 2. Sun and Oracle are championing it. In fact, the only major vendor to be bucking the trend and advocating the rise of the fat client these days is Microsoft.

Microsoft officials aren't using the "f" word in their quest to put a copy of Windows and Office on every desktop. Rather, they're espousing "smart clients" and/or "rich clients".

Microsoft claims that users of all kinds, from students through to IT managers for large corporations, are tired of living in their browsers. They don't want the bottlenecks imposed by Internet connection speeds; rather, they are interested in the ability to switch seamlessly between offline and online. They want souped-up graphics, always-on instant messaging and an immersive computing experience. Or so Microsoft says.

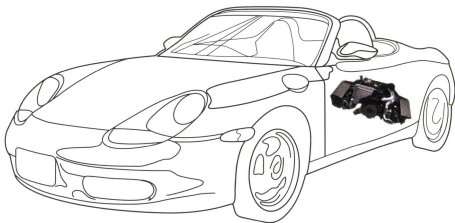
I'm not sure many customers have actually articulated this, but there's no doubt the shift in emphasis is convenient for Microsoft, which is continuing to fold everything but the kitchen sink into Windows. Internet Explorer, Windows Media Player, search — all are components of Windows, not individual products, despite Microsoft's arguments to the contrary.

Yet in spite of all this "smart client" hoopla, Microsoft is still hedging its bets and hasn't completely abandoned its thin client approach.

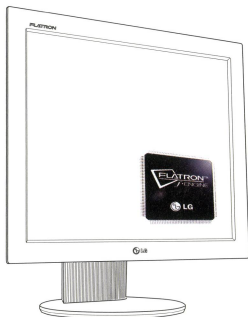
In 2005, Microsoft is expected to launch a marketing campaign around the "branch server" concept. The message: Windows Server 2005 (or whatever Microsoft ends up naming the so-called "R2" release of Windows Server) makes a heck of a platform for customers who hang a bunch of slimmed-down remote Windows clients off a centralised server. We've even heard rumours that Microsoft might opt to package up a special Windows Server SKU and call it "Branch Office Server".

Microsoft is famous for pitting different teams within the company against each other and allowing the best solution to win. If I were to bet on a winner, I'd predict the Redmondians will be largely unsuccessful in getting anyone other than some of its independent software vendor partners to abandon the Atkins approach for the all-you-can-eat fat client one.

Editor of Microsoft Watch (www.microsoft-watch.com), Mary Jo Foley is one of the world's most prominent longtime Microsoft pundits, covering the software giant since the early 1980s. Each month Foley sounds off exclusively for APC on Longhorn and more.



FROM ONE HIGH POWERED ENGINE TO ANOTHER.



***Real Colour Management**



Before



After

***Adaptive Colour, Contrast Enhancement**



Before



After

Introducing LG's Flatron f-Engine. The world's first picture enhancing chip for LCD monitors.

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Life's Good

GameDude or GameDud?

There are many dedicated PC assemblers who provide great service, but one customer says he had an exceedingly bad experience with GameDude.

Dear Watchdog,

I requested a quote for a new PC from GameDude in mid-July. When the quote arrived a few days later, I made a deposit by direct bank transfer, having been told I could pay the balance by credit card (there was no mention of a surcharge).

A few days later, a technician called to say that the 8x DVD burner I wanted was not available, but a new 12x Double Layer DVD burner was in stock.

I asked him to try to source an 8x burner, and if he was not able to do so by the following Monday, to go ahead with installing the 12x burner into my system. The technician said this would be fine — come Monday or Tuesday, when I wanted to pick up the assembled PC, all that would need to be done would be to install the burner.

I then asked if the system would be ready for collection on Thursday. The technician said it would be ready as requested.

I arrived at GameDude at about 11:30am on Thursday to collect the system only to be told that it hadn't been built yet. The salesman then indicated it would take about

an hour to build the system, half an hour to test it and a further hour to load the OS.

I returned at 4:10pm only to be advised that they had only just started on the motherboard. Eventually they agreed the system would be built by 5.10pm. When I returned, I was about to pay by credit card when a salesman told us there would be a 3% credit card surcharge.

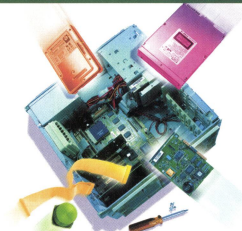
At that stage, I'd had enough. I told him not to bother and asked for the return of the deposit. He returned with the deposit and I left the store.

Roy Mientjes
Carina, QLD

It's not the first time GameDude has graced the pages of Watchdog over service issues. We invited GameDude to explain what went wrong.

Dear Watchdog,

The basic rundown [of events] in the letter is correct, however at no stage did we provide a date of completion as this can vary. In this case, one item was obsolete and on the



Time and trouble: miscommunication appears to be the problem for some box builders.

instruction of Mr Mientjes, we waited a few days before supplying the newer model part.

Since we generally only build systems after all parts have been sourced, there is usually a few days' wait for building. Our policy is to call upon completion and, as far as I know, Mr Mientjes made no calls prior to showing up at our store.

Upon arrival, Mr Mientjes was indeed informed that his PC was not finished and one of my staff gave an average time to finish the job. However, Mr Mientjes took the timeframe literally and showed up at exactly the time my staff had given as a general indication.

We finished the PC after staying open after hours, but when we asked for payment, a credit card was produced and we informed Mr Mientjes of the 3% surcharge.

Router rage

Dear Watchdog,

I suspect that Netgear does not actually have a support line — just an endless muzak tape and "soothing" messages.

After a problem with a Netgear router, I vented my frustration by writing Netgear an email, which generated this response: "Please be advised as of 1/6/2003 the support@netgear.com.au is no longer a manned email address. We do however have an option for our customers to log a support request via our online Web form."

I could not get on to their Web site because their stupid router would not connect. Once I bought another brand (which worked fine) there was no point in accessing their Web site.

What good is online support if you can't connect, and therefore can't get on to the

Web? Their telephone support seemed only to exist as muzak and a recorded message saying that their support staff were terribly busy. I stayed on hold for two hours without getting anyone.

I have now got a refund on the Netgear router, but I suggest that part of any APC product test is to check out the quality of support for the product.

Tom Caldwell
Coffs Harbour, NSW

Watchdog approached Netgear and asked if Caldwell's experience was typical of the service offered by Netgear.

Managing director Ian McLean declined to comment on this specific instance, but said that Netgear's service level expectation was that 80% of calls

to its support line would be answered within three minutes and 90% of calls would be answered within five minutes.

"This is a 24 hours a day, seven days a week free service," McLean said. "Between 9am and 6pm everyday, our calls are serviced by an Australian support team. Outside of those hours, the calls are farmed out around the world. However, calls are still generally answered within one or two minutes," he continued.

"It's important to realise that the vast majority of [companies in] the industry don't offer 24-hour telephone support."

Have you had a good or bad experience with hardware makers' tech support? Let us know: watchdog@apcmag.com

Contact us

WE WANT TO KNOW

how IT companies are really treating you. Letters must be under 500 words and include your full contact details and any product information. Write to: watchdog@apcmag.com or PO Box 4088, Sydney NSW 2001. All correspondence becomes the property of APC and is subject to editing.

Mr Mientjes did not want to pay. By this time I wanted to go home and he was being too much trouble so we gave him his money back and asked him to leave.

Taking back a system we've already assembled costs us money as we cannot sell the components separately again and now have to find another customer who wants to buy this exact system configuration.

Doriano Bussenius
director
GameDude Computers

DSL TRANSFER MUX UP

I live in an estate where there's no ADSL due to RIMs and despite repeated ADSL applications, transposition of the RIM hasn't been possible.

My husband is an IT professional who needs both fast downloads and low latency, so we've had to bite the bullet and install both satellite with a permanent dialup modem link for the upstream and 128K ISDN separately.

A week after ISDN was installed, Internode contacted us to say that our ADSL had been provisioned. We couldn't believe it! After two years, we had been transposed to an ADSL-enabled RIM! But after a few days, the status changed to "Held — no CMUX ports."

It turns out that Telstra had transposed us to an ADSL-enabled RIM that was already at [full] capacity. What was the point?

Making enquiries with Telstra as to why they took this course of action, whether more CMUX ports were being installed, or even if the RIM can take more than one CMUX card, is impossible. It's the complete stonewalling from Telstra at every turn in trying to obtain even the most basic of information that I find the most frustrating.

Mandi Nugent
Beaconsfield, Vic

Dear Watchdog,
The MiniMUX installed in Ms Nugent's RIM was a first generation model and only had 24 ports available. It reached capacity very quickly as demand was swift — ports are allocated on a first come, first served basis, as

Software fine print causes headaches

Michael Matthews of Port Macquarie, NSW, was hunting for software that would allow him to edit PDFs when he came across Jaws PDF Editor on British company Global Graphics' Web site. He needed it urgently and couldn't find a trial version listed, so he reluctantly paid for the full program, sight unseen.

After paying by credit card and receiving a serial number, he was about to download the software when he noticed trial versions were available. Reading the EULA, Matthews found a clause stating: "If the End User does not wish to be bound by the terms of this Licence, the End User should not install, load, copy, store or otherwise use the Software, and return the Software for a refund of the total charges."

On enquiring, however, he was told that his purchase was non-refundable because a serial number had already been issued.

"I acknowledge that my decision to purchase this software was made in haste," Matthews told Watchdog, "but I believe Global Graphics' Web site link structure was partly responsible and they should honour the refund provisions of the EULA."

Watchdog contacted Global Graphics and pointed out that it appeared to be bound by its own EULA. Regional sales director James Bidewell responded: "If an end user proceeds

through the Web site to make an online purchase of Jaws PDF Editor, they are presented with a checkbox that asks them to confirm that they are aware there is free evaluation software available to them. If the end user does not check this box, they do not proceed to confirm their purchase."

After further investigation, Bidewell admitted that Matthews had purchased the software as a "companion upgrade" which doesn't require the evaluation checkbox to be selected, so he would never have known about the trial version until he reached the download page — after purchasing the product. He

said this problem would be fixed and Matthews would get his refund.

Watchdog pointed out that regardless of the checkbox issue, the EULA clearly states that if a user doesn't agree to the licence terms, the software can be returned for a refund. We asked whether the company would alter its EULA to remove such ambiguity. Bidewell could not immediately provide a response.

The confusion over the EULA refund clause raises the question: do software vendors now pay as little heed to what they put in their licenses as users generally do? Are these lengthy user contracts unworkable? Tell us what you think: watchdog@apcmag.com.

is only fair. The transposition for Ms Nugent's phone line was necessary for when new ports are added by use of the next-generation NEC Small DSLAMs which have substantially greater capacity.

Telstra recently announced a \$28 million RIM upgrade, and details of this upgrade are currently being finalised.

Liz Jurman
manager, public affairs
Telstra Wholesale

While it looks like there may be hope yet for the Nugents' ADSL connection, they're unimpressed with the situation. "My phone bill last month was \$724 for communications," Mandi's husband James told Watchdog. "I don't mind paying as long as they can provide me service. I don't know what we can do; we can't even really do local marketing because the area is technically 'already ADSL enabled'".

Are these lengthy user contracts unworkable?

PIERCING LADY PUNCHES THROUGH

Piercing Lady Judith Walsh, whose domain had expired and been snapped up by a "generic domain name search engine" has had a win in her battle to get it back.

Following our Watchdog investigation (APC September, page 35), the person who had purchased her piercing.com.au domain and was offering her a "business partnership" on the name, has since contacted her and agreed to transfer it back to her. "I just hope other readers aren't caught in the same predicament," said Walsh.

Error log

In APC's digital TV card Labs Challenge (September 2004, page 100), the picture of TwinHan's VisionPlus VisionDTV TER was inadvertently transposed with the Nebula DigiTV PCI cards. APC apologises to TwinHan, Nebula, and readers for any confusion caused.

Offshore IT touches nerve

The Australian Computer Society's policies have met with industry criticism, but are the rumblings justified?

I was surprised and disappointed to see the disparaging comments about the leadership of the ACS ("Dispatch", APC August, page 26).

Using emotional language more appropriate for a sensationalist broadsheet, Mr Montgomery's comments were both poorly researched and absurd.

Mr Montgomery implied that the ACS has turned [on] our members to pursue a political agenda. However, he failed to mention that a survey of ACS members this year found over 97% supported a stronger focus on policy development and advocacy.

ACS has made substantial progress this year in policy development, industry liaison and government lobbying, all of which have enhanced our ability to positively influence decisions affecting our industry and profession. This progress clearly benefits our members — as well as the broader industry. Any claims to the contrary are ludicrous.

Mr Montgomery has been careless in his assessment of the ACS Offshoring Policy and Cost-Benefit Checklist. Neither of these documents is designed to encourage

offshoring, as the column suggested, but to ensure that where companies do choose to send ICT work offshore, they make considered and responsible decisions that minimise the impact on Australian ICT professionals.

As the ICT sector's largest representative body, we accept that not everyone supports our initiatives. Indeed, we welcome constructive criticism and informed debate as feedback against which to measure our progress.

Unfortunately, Mr Montgomery's comments contribute nothing in the way of addressing the challenges facing this sector.

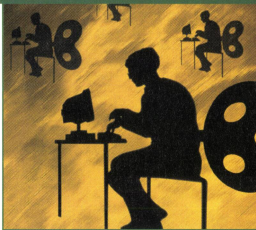
Edward Mandla
president

Australian Computer Society

DISGRACEFUL AND IMMORAL

Your Workshop entitled "Back door access" (APC September, page 132), where you not only gave a step by step guide to employees on how to "punch through" corporate Internet restrictions, but also included the tools on the CD was reckless and downright stupid.

Corporations in Australia are spending



Code cutters: a proliferation of overseas talent is threatening local jobs.

small fortunes each year in an attempt to firewall their systems against attack, not only from outsiders but from malicious and naive sources within. Internet sites are blacklisted [from businesses] for very good reasons. Either they are sources of distraction to productivity (such as eBay and Trading Post), outright immoral (such as pornographic and music download sites), or just sources of unwanted software.

To claim that your article was merely bringing these practices to the attention of systems administrators was bordering on farce. Sure, plenty of the smart, computer-savvy employees may already know these techniques, but many of the lesser-skilled were given a "dummies guide" to corporate security vandalism.

Letter of the month

WHO'S BENEFITING FROM SPAM?

All spam has one thing in common — the spammers want your money. While it may not be possible to find the source of spam by tracing its delivery path back to the original sender, there is another way of determining its origin: follow the money.

Every spam message will contain a link to a Web page where the spammer will attempt to get your credit cards details out of you in return for their "service".

This information has to go to a credit card company for validation, which in turn forwards the cash (minus commission, of course) to the spammer. There's a definite link between the Web site and the credit card company, and there's a definite link between the credit card company and the spammer's bank account. If either of those links are broken, our friendly spammer doesn't get the cash.

So the obvious question is: just how much money are credit card companies making from spam?

In recent times, spam has gone beyond being a nuisance — it now actually threatens the viability of email as an effective form of communication for both business and personal use, as well as exposing our children to words and images that, quite frankly, they shouldn't be exposed to.

Why should credit card companies profit from such activity?

While we're on the topic, domain name authorities should also be given stronger powers to rapidly strip known spammers of their Web site DNS entries so people can't be sucked into their scams.

Adam Paull
Pymont, NSW

While credit card companies have until now been mostly helpful when it comes to refunding money from fraudulent Web transactions, who is processing spammers' takings? For his musings, Adam gets our letter of the month prize — a Logitech Cordless Desktop LX 700, valued at \$199.95.



Prize Pit

The lucky winner of our September subscription prize of a Brother HL-2700CN colour laser printer is **J. Roberts of Rivett, ACT.**

The eight winners of the Brother PT-2300PC labellers are D.C. Brown of Tanah Merah, Qld; J.D. Boys of Indooroopilly, Qld; D. Hill of Western Creek, Tas; S. Stavrou of Marleston, SA; D. Spencer of Montemorency, Vic; A. Nugroho of Coburg, Vic; E.W. Harris of Hillarys, WA; and S. Keane of Vermont, Vic. Congratulations!



Apart from this particular article, your magazine is the pick of the crop. I hope this is just an aberration.

Stephen Bitmead
One Tree Hill, SA

IN DEFENCE OF MELBOURNE IT

After reading the story about Judith Walsh's domain name being snapped up by a search engine company (see Watchdog, page 27), I feel I should tell my story.

I have a domain name registered with Melbourne IT and received a renewal letter by post five weeks before its expiry. I was also sent emails two months prior, one month prior, 14 days prior, and seven days prior to expiration. On the day it was due to expire, I received an "urgent reminder" renewal notice.

I wonder whether Ms Walsh may not have been reading emails addressed to her registered email address, one not involved in the day-to-day operation of her business, or if she didn't keep her domain registration details up-to-date. Top marks to Melbourne IT in my experience.

John More
Brighton, Vic

PASSING THE BUCK

Although I feel very sorry for Judith Walsh losing her prized domain name to Online Referral Networks, she has no right to blame Melbourne IT for allegedly not notifying her that it was about to lapse. Melbourne IT might have a different version of events.

I own two domain names registered with Melbourne IT and I note their expiry dates in my calendar to remind me to renew them, regardless of any notification sent by

Melbourne IT. I fully understand how valuable my domain names are to my business.

Ms Walsh, you are running a business and part of that business is safeguarding your domain name, one of the most important assets in this day and age. If by your negligence you have allowed it to lapse and somebody else has acquired it, you need to acknowledge that although morally reprehensible, the acquisition was legal and you can only blame yourself.

Ziggy Malter
Dural, NSW

COMBINING DRIVES A BAD IDEA

Could you please inform [APC journalist] Nick Race that having only RAID 0 is a bad idea on the desktop? The last thing people need when losing a disk is realising they've lost all of their files and data instead of one disk's worth.

A much more sensible configuration would be a smaller main drive for storing the system and critical data that can easily be backed up, and a separate drive or RAID array that can hold the larger, disk-bound apps (games in most cases).

If we could stop propagating the myth that RAID 0 is a silver bullet for reducing the problem of disk I/O speeds, I would be very grateful.

Malcolm Burtenshaw
Currumbine, WA

APC's Nick Race responds: I agree that a RAID 0 configuration can be a risky venture, essentially doubling the chance of major data loss should a drive fail. On the flip side, I also advocate a regular and complete backup plan which can minimise losses should hardware failure occur. Unfortunately, that's often sorely lacking in many PC users' housekeeping.

As you noted, a third, smaller drive for the operating system and critical data is ideal and it is pleasing to note vendors coming round to this more balanced method of storage. Keep an eye out for an upcoming Workshop article based on Intel's new Matrix RAID technology built into the i915x and i925x chipsets. This will allow users to run both RAID 0 and RAID 1 configurations on only two disk drives, and offering speed where it is required and data redundancy where it is needed.

KUDOS FOR BIGPOND

I don't see what all the fuss with BigPond is. About a year ago, I phoned Telstra and asked to sign up. I received the CD four days later, but it didn't work. No problem, I phoned BigPond and they guided me through. I have so far had no problems, no busy signals and

Agenda:

Your place to vent

RETRO ADVERTISING

I was searching APC's August edition for a 120GB hard drive and video card to upgrade my ageing computer system when I came across an ad on page 158. I didn't find a 120GB drive, but rather a 20GB one — and for \$170.

I had to check the cover date to ensure that I hadn't found a stash of yesteryear's magazines in the newsagency.

Once I realised the ad was a misprint of old ad artwork, it was quite amusing to look back at the pricing. I was reminded of how much value we're getting these days.

I purchased a 486DX system some years back and paid over \$4,000 with a 200MB hard drive (yes, enough to hold two ZIP disks). And that was a bargain at the time!

Wayne Ness
Port Hedland, WA

Thanks to everyone who wrote pointing out the misprint in August. Australia Computer Online probably got more exposure than it bargained for when its ad artwork from July 2001 was inadvertently published in APC. A write-up at Overclockers Australia looking at other "vintage advertising" from two decades of APC editions was subsequently linked from the huge global tech Web site Slashdot. The Overclockers Australia write-up can still be accessed via www.apcmag.com/info/ocau.

am 95% happy (the 5% is because I can get broadband but I can't afford it!).

William Hook
Heathpool, SA

STILL A SCREAMER AT HALF THE PRICE

I liked the Labs Feature "Building an all-out screamer" (APC July, page 96) and am always interested in what other people's idea of their dream system would be.

I've been hearing a lot about the amazing tech bargains to be had on eBay and, following the suggestion in the article, I had a quick look.

I was truly impressed that I could buy a real "screamer" with X-Alien aluminium case, ABIT AV8 motherboard, AMD Athlon 64 3500+, 1GB Corsair ram, WD 74GB Raptor HD, Plextor 12x DVD±RW, AOpen 256MB FX5700LE DVI/TVO video card and Belkin wireless keyboard/mouse, all for US\$1,499. Even if you halve the price [of the APC system] to allow for a 30in LCD screen and soundcard, it's still much more expensive than the eBay box.

It shows that it's not just out-of-date tech that can be had for a bargain on eBay. If I had the cash I'd be sold on an eBay screamer.

Adam Skinner
Wellington, New Zealand

Bear in mind that prices listed in APC are recommended retail prices, and you'll often find cheaper street prices from resellers. It's also questionable whether the risk of buying a computer from overseas is worth it — what if you have a warranty issue? That's not to say there aren't great deals to be had on eBay, but it's worth taking a "buyer beware" approach.

ALTERNATIVES TO .NET

I recently read the review of RealBasic 5.5 (APC August, page 54). I had not heard of this platform before, and being a seasoned VB programmer, I thought I'd give it a go.

To my surprise it is quite powerful, and probably worth more support. I have been looking for a platform like this that solves the issue of distributing a simple application without the huge overheads of .NET.

Even VB6 has its support problems when your end users install other applications with DLL conflicts. So it was a nice change to have a Basic-styled language that would compile to a single EXE.

In the past, my only alternative has been Delphi, and that is quite an abstraction from VB. Now I can develop the simple to medium-level projects in RealBasic and distribute them via the Web without potential customers leaving due to the download size.

I realise I could develop in .NET and point customers to Microsoft for the MacDac and .NET Runtime, but how many customers would I lose?

John Sainsbury
Stratford, Qld

ABSOLUTELY EXETEL DEAL

Regarding the article "Netspace slam dunks DSL competitors" (APC July, page 117), I'd like to compare eXeTel's and Netspace's ADSL plans.

eXeTel's starting plan is 256KB (64KB upload) line speed with 1GB of included downloads, at \$30. Their medium plan is 512KB (128KB upload) line speed with 10GB of included downloads at \$47.50, and the heavy plan is 1,500KB (256KB upload) line speed 30GB of included downloads for \$100.

Now for the added extras. At eXeTel there is no speed shaping, however if you do go over your limit, you are charged \$3 per gigabyte. This is far and away the best price of any company in Australia — most companies' excess usage rate is something like 15c per megabyte, which translates into around \$150 per gigabyte! Add to this the fact that traffic between the hours of 12am-8am is free and eXeTel's services become too hard to resist.

Netspace includes generous download limits but restricts when you can use them.

The 32GB download limit means you get 16GB during peak hours and a further 16GB during off-peak hours, and they, like most ISPs, utilise speed shaping. It looks nice, but isn't nearly as generous or versatile as eXeTel.

While eXeTel is only available to NSW customers, there is another company, AANet, with almost identical plans and business philosophy who provide service to Victoria and Queensland.

Neither company has a 1800 number for technical support, but they do have very friendly forums where you can discuss your issues and get prompt solutions from experienced people, whether they are customers or administrators.

These companies should not go unrecognised as they are clearly the ones doing the slam dunking.

Jahna White
Albury, NSW

APC's Dan Warne responds: AANet and eXeTel certainly do offer great value, and we covered eXeTel's pricing in APC May (page 32). However, when we're writing about ADSL services in the Broadband Directory (page 105), we focus on services that cover at least three states, one of which must be either Victoria, New South Wales or Queensland. That ensures that our articles are relevant to at least a good proportion of readers. But it's also to ensure that judgement calls we make on value are made on a fair basis. It's a lot cheaper and easier to run an ISP which only covers one or two states, without free or local call tech support.

How to get your free Ricoh camera with your flexible Ricoh printer.



The world's fastest digital camera.

Don't miss this incredible offer. Buy the world's most flexible printer and we'll give you the world's fastest camera absolutely free. This is an exceptional offer because the Ricoh Caplio R1 is such an exceptional camera.

Why? Well, the trouble with most digital cameras is they're too slow. By the time you take the photo the moment's passed. But the new Ricoh Caplio R1 is 5 times faster than the blink of an eye. So you won't miss a single memory.

Its "focus and shoot" at 0.05 seconds, is up to 25 times faster than other digital cameras. Even its start-up time is a mere 0.8 of a second.

It's way ahead when it comes to features too:

- A 4.8x optical zoom (28-135mm) — the widest zoom range of any slimline digital.
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- 1cm macro mode.
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- An ultra modern design in either brushed silver or black metal.

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Ricoh. The most flexible printers.

RICOH
Image Communication

Have your say

Add to these discussion threads or email your views (in less than 500 words) to epinions@apcmag.com.

All correspondence becomes the property of APC and is subject to editing. Letters sent to epinions@apcmag.com must include the writer's full name, suburb, state and phone number to be considered for print publication and in the running for letter of the month prizes. Phone details will not be published.

A large, light-colored Ricoh Aficio printer is the central focus, positioned on a blue mat on a wooden floor. In front of it, six Ricoh Caplio R1 digital cameras are arranged in two rows of three, each on a small blue rectangular base. The scene is lit with warm, natural light from a window on the right, casting long shadows. In the background, a small Buddha statue sits on a dark pedestal. The overall aesthetic is clean and modern.

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Buy a Ricoh business colour printer & we'll give you the world's fastest digital camera, the new Ricoh Caplio R1, absolutely free. This is an amazing offer, so call Ricoh on 1800 181 002 now or visit us at www.ricoh.com.au
Ricoh. The most flexible printers. *Offer available on the CL3100N, CL7000 and CL7100. Limit 2 cameras per organisation, offer ends 10/12/04.

RICOH
Image Communication

When it comes to colour laser printers, EPSON means business.



AcuLaser C900

AcuLaser C1900

AcuLaser C4100

EPSON colour. EPSON dependability. Affordable prices.

With EPSON's great range of colour laser printers, you're sure to find the right printer for your business. From the stand-alone user or small office to high demand printing – we've got the perfect printing solution. Only EPSON's advanced imaging technologies and superior laser data processing system ensure great colour reproductions every time. So now you can rely on EPSON to give all your documents the professional edge. Check out EPSON's colourful range today, visit www.epson.com.au or phone 1300 361 054.

apc Labs Challenges

56 Systems Sub-\$4,000 power systems

Nick Race and Matthew Overington check out 10 PCs designed with multimedia in mind.



62 Hardware Digital SLRs

Matthew Overington and Robert Craft get bitten by the shutter bug and look at three top-of-the-line digital SLR cameras.

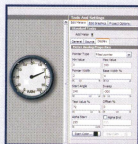


66 Hardware B&W laser printers



Once largely confined to businesses, laser printers are now well within reach of the home office. Nick Race rounds up eight market leaders.

72 Software PC monitoring



From your computer's perspective, the world is a complex system of circuits and processes. James Bannan looks at a variety of packages that let you keep an eye on what's going on.

36 Hardware Intel EM64T processor

After a year of playing catch-up, Intel has finally released a 32/64-bit workstation processor. Will it make a dent on AMD's Athlon 64?

38 Software Microsoft Visual Studio .NET 2005

Visual Studio.NET 2005 is in its near-final beta, with Microsoft touting it as a cornerstone of the eternally overdue Longhorn operating system.

40 Internet Unwired wireless broadband

A wireless ISP that offers acceptable speeds with pricing close to ADSL? Sounds too good to be true.

42 Software Fedora Core 2

The second release of Red Hat's freeware operating system really impresses.

44 Hardware ATI Radeon X800 Pro versus Nvidia GeForce 6800GT

The APC Labs team put the latest ATI and Nvidia mid-range gamer cards head-to-head.

45 Hardware Netgear GS724T SmartSwitch

Netgear's GS724T SmartSwitch brings managed network features to a more affordable price bracket.

46 System Com-Tek CL-56 notebook

Com-Tek's desktop replacement shows solid performance and provides an argument for buying "white box" notebooks.

48 Software TextPipe Pro 7

Data conversion and extraction tasks are easy thanks to this industrial strength utility.

48 Software PageQ Editor

A real delight for the habitual browser, but the price tag may be difficult to justify.

50 Best Buy Sub-\$1,000 PCs

Who says you've got to spend big to get high performance? Matthew Overington looks at three top performers under a grand.

52 Best Buy Wide-screen notebooks

Nick Race and Matthew Overington put four top wide-screen notebooks side by side.



Trading places



Editor's Choice: this is awarded to the product that offers the best blend of features and performance. This product stands out above the competition as simply the best in its field. A product must score 4.5/5 to qualify.



Highly Recommended: awarded to products that don't quite make Editor's Choice, but still stand out due to a particular feature or overall performance. Any product scoring 4/5 qualifies.



Best Value: as APC hands out Editor's Choice and Highly Recommended awards based on features and performance, often there's a standout product at a low price that misses out. This award is presented to the product which falls highest above the line of expectation in the Price-to-Performance graph (see below).

It's been a long time coming. Although Intel has been at the forefront of processor design for most of the development of the PC, the company hasn't always got it right.

Intel has long said that building a chip that bridged 32- and 64-bit operation was impossible, and that a step up to 64-bit was beyond the capabilities of the x86 architecture. Nonplussed by the challenge, AMD engineered and released a range of 64-bit x86-compatible processors last year. Intel had to play catch-up, and this month its first 32/64-bit Xeon workstation processors got a run in APC's Labs.

Intel has launched its product to tie in with Microsoft's release of Windows XP for 64-bit Extended Systems. The processor has put the two dominant CPU manufacturers on an even playing field for workstation and high-end gaming platforms. The Intel and AMD processors are 99% compatible, so even though they will run most of the same code, there will invariably be a few exceptions. The market will decide whether or not these exceptions prove significant enough to dent the sales of either processor.

After being beaten to the punch with 64-bit x86-compatible processors, Intel looks to have

been outdone in the dual-core battle, too. Intel president Paul Otellini announced the upcoming release of its dual-core technology at September's Intel Developers Forum in San Francisco, where it was able to show off a dual-core Itanium. But AMD, which claims it's had the capability to produce dual-core since the release of the K8 (Athlon 64) architecture, was also demonstrating a working machine... in a hotel just across the road!

VIDEO NICETIES

We've also managed to get the latest ATI and Nvidia video cards into the Lab for testing, and the results are interesting. ATI has been the performance leader for the last year or so, consistently producing graphics cards which slightly outperform rival designs. Nvidia has been trying to keep up, and while it still enjoys solid sales in Europe and the US, the GeForce line has been outsold in the local market.

We pitched an ATI Radeon X800 Pro and Nvidia GeForce 6800GT head-to-head in the Lab on current-generation graphics benchmarks and gaming tests and found the Nvidia card came up trumps. Given that it also offers Pixel Shader 3 support — which will be widely used in upcoming games — it looks as if the tide has turned again.

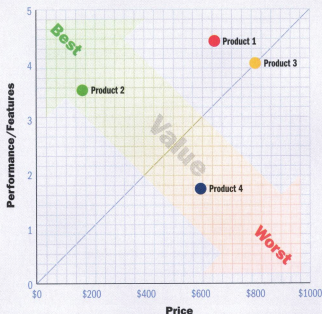
BIGGER AND BETTER

As I write, we're clearing space in the APC Lab to review a number of 19in TFT panels. As technology develops and prices drop, 19in screens have come to occupy the sweet spot in terms of price and size. This comes as many manufacturing facilities are increasing the number of 19in screens that can be cut from a single substrate. Models of this size are now available for less than \$1,000 — around the same price as 17in screens this time last year.

It's not just prices that are dropping, either. Some companies are even boasting 12ms pixel response times on their 19in units. This is an incredible figure — only recently attained in the 17in arena — and proves just how quickly the entire field is developing. A pixel response time of 12ms means a screen is easily up to the demands of high-speed gaming or DVD playback. We'll be thoroughly testing the manufacturers' claims and reporting on how these units perform relative to the rest of the pack in the December issue of APC.

Matthew Overington

apc price-to-performance ratio



The APC Price-to-Performance Ratio is a scatter graph, each point representing a reviewed product. The X-axis provides a price scale, and the Y-axis indicates features and performance as derived from the verdict awarded to each item. The diagonal line represents a line of expectation — as prices increase, a proportional increase in features or performance is also expected.

THE POSSIBILITIES ARE INFINITE

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Fujitsu recommends Microsoft® Windows® XP Professional.



personality

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¹ Optical drive and configuration vary between models selected.

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Chips ahoy: Intel has managed to level the playing field by matching AMD's 32/64-bit processor.

Although Intel has been producing 64-bit Itanium processors since 2001, they remain expensive and limited to server applications. They also use a different 64-bit instruction set to AMD's designs. Intel's new line of EM64T Xeon and Pentium 4 processors are compatible with the AMD version, and not the Itaniums. Microsoft already supports the Itanium 64-bit instruction set, and this move reduces complexity for the company's development; it only has to support two 64-bit instructions, rather than three.

The fact that Intel's instruction set mirrors AMD's drew some attention. In April 2004, Tom Halfhill, an analyst from US research company In-Stat/MDR claimed that the instruction sets of the Athlon 64 and Opteron processors were almost identical to those in testing by Intel for its 64-bit Xeon line. Intel and AMD have a patent cross-licensing agreement, but Halfhill believed that the chips' instructions were so similar that Intel must have reverse-engineered the AMD designs. Later additions to the AMD instruction set added two instructions that aren't found on Intel's version. According to Halfhill, this indicates that Intel copied from an early version of AMD's designs. This slight difference means that although the two processors aren't 100% compatible, they are close enough to run a single OS. Intel and AMD have both refused to confirm whether the instruction set was co-developed, and it's of little relevance anyway: reverse-engineering is a common practice for rival chip makers keen to mirror an opponent's product.

MASSIVE CHANGES

Intel has brought forward a large number of changes with this release. Intel is labelling its 32/64-bit processors EM64T, but they are 99% compatible with AMD's AMD64 line and both will run Windows XP (or Windows Server 2003) for 64-bit Extended Systems. The processor was launched at a range of speeds from 2.8 to 3.6GHz.

The older Xeon chips are built on a 130nm process and feature a 400- or 533MHz frontside bus speed. These are fitted with 512KB of Level 2 Cache and either 1MB or 2MB of Level 3 Cache. This provides a peak I/O bandwidth of 4.8GB/s, which is a little down on the 6.4GB/s offered by the Athlon 64. The new model moves to a 90nm manufacturing process and boosts the frontside bus speed to 800MHz. The Level 2 Cache is doubled, up to 1MB, though the processor now forgoes Level 3 Cache memory. The processor matches the bandwidth of AMD's range, providing a peak of 6.4GB/s. The new chips also add support for Intel's Streaming

Intel catches up

After a year of playing catch-up, Intel has finally released a 32/64-bit workstation processor. Will it make a dent on AMD's Athlon 64?

Xeon chips and prices

3.6GHz	\$851
3.4GHz	\$690
3.2GHz	\$455
3.0GHz	\$316
2.8GHz	\$209

(US\$, each chip in batches of 1,000).

Details Xeon processor

Contact	Intel
Phone	(02) 9937 5800
Online	www.intel.com.au
Price	3.6GHz: US\$851 each (in batches of 1,000)
Intended market	Performance enthusiasts
✓	32/64-bit performance.
✗	A year behind AMD.
Verdict	★★★★☆

Intel, a company used to driving the development of new PC technologies, has been in the back seat since AMD released the Athlon 64 last year. But all that is changing. Intel launched the first of its 32/64-bit Extended Memory 64 Technology (EM64T) processors at the end of June, and several local vendors are now shipping systems.

Intel has long claimed that a 32/64-bit processor wasn't on the corporate roadmap, and in fact, that it was too technically challenging to attempt to build a chip that bridged both modes. AMD managed, for the first time in its history, to one-up Intel by producing a processor capable of running 32- and 64-bit applications side by side.

The launch of the AMD64 platform was a major step forward. Just as PCs moved from 8-bit machines to 16 and then 32-bit operation, systems of the future will increasingly rely on 64-bit processors. As processing loads increase, it will become important to be able to work simultaneously on large chunks of data. The trouble is that most of the software available today has to be re-engineered to take advantage of the extra processing capability gained by moving from 32-bit to 64-bit.

SIMD Extensions 3 (SSE3), designed to speed up media and graphics processing.

The Xeons also include a new feature called Demand Based Switching. The chips all employ Enhanced SpeedStep technology, which is able to throttle back CPU speeds based on processor load. This means that the server runs quietly and efficiently during times of little load, then winds up when the processing requirements increase. This roughly equates to the Cool 'n' Quiet feature found on AMD's platform — another area where Intel has reeled in the opposition.

The move to a 64-bit processor also required a chipset update. Intel's new E7525, E7520 and E7320 chipsets bring the changes that graced the

Pentium 4 platform earlier this year to the Xeon line. These include support for PCI Express x1 I/O, and PCI Express x16 video, DDR and DDR2 memory as well as integrated Gigabit networking. Intel has also launched a number of new dual-processor motherboards to take advantage of the new Xeon.

Intel is targeting the processor towards dual-processor server and workstation applications, where price is less of a concern for buyers. A few systems will undoubtedly make it home for high-performance gaming rigs, but with processors retailing at up to US\$851 each (in groups of 1,000), expect these to be few and far between.

Matthew Overington

Inside info

- Intel EM64T white paper
www.intel.com/technology/64bitextensions/index.htm
- AMD AMD64 white paper
www.apcmag.com/info/AMD64_whitepaper
- Intel E7525 chipset
www.apcmag.com/info/E7525_whitepaper

Bench press

APC obtained an Acer Altos G520 server built on a 3.2GHz Xeon processor and 512MB of PC3200 DDR2 RAM. This unit was benchmarked head-to-head with an Athlon 64 3400+ and an ABIT KV8-MAX3 motherboard, fitted with 512MB of PC3200 DDR RAM.

In CPU integer tests under SPEC CPU2000, the Xeon achieved a slight lead, scoring 1,517 against the Athlon 64's 1,292. This was reversed in floating point processing tests, where the Athlon shows its strength, managing 1,329 over the Xeon's 1,210. The clock speed of the two processors is comparable — both were tested with a single 80GB Seagate Barracuda 7200.7 Serial ATA hard drive and Windows XP for 64-bit Extended Systems. The Altos G520 runs at a fair clip and includes the latest PC technology. It performs at around the same level as competing AMD hardware, but a price for the system hasn't yet been set.

The Xeons closely match the performance offered by the Athlons, even though they use DDR2 memory, and there's little benefit in going for one over the other. This is great for consumers, as both companies are likely to offer compelling deals to gain market dominance in the early days of mainstream 64-bit computing.

Benchmarks

SPEC CPU2000 SPECint integer test

Xeon EM64T	1,517	
Athlon 64	1,292	2,000

SPEC CPU2000 SPECfp floating point test

Xeon EM64T	1,329	
Athlon 64	1,210	2,000

Benchmarks under Windows XP for 64-bit Extended Systems.

Although Microsoft has only recently been able to put the finishing touches on compatible 64-bit versions of Windows XP and Windows Server 2003 (though Red Hat, Mandrake and SuSE Linux distributions all support the 64-bit processors), Athlon 64 has enjoyed solid sales at the workstation and high-performance desktop end of the market.

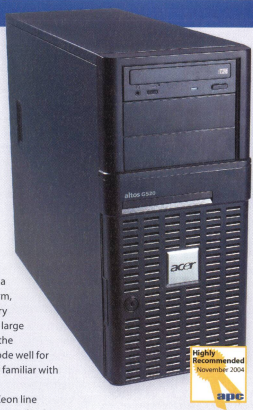
POWER PLUS

The Athlon 64 has also earned a reputation as a gaming platform, thanks to its enormous memory bandwidth and ability to push large amounts of data in and out of the CPU. This market lead could bode well for AMD, as customers are already familiar with 64-bit Athlons.

On the other hand, Intel's Xeon line benefits from years of marketing and industry presence, giving its 64-bit version a leg up in companies that are already running older Xeon workstations or servers.

The fact that Intel has released a 32/64-bit processor shows that AMD's technology is far from a flash in the pan. With the industry's biggest players both heading in the same direction, it's fair to assume 64-bit is the way of the future.

Intel is also releasing 64-bit versions of its Pentium 4 line to fill the entry-level server and workstation market. Expect these to be reviewed in an upcoming issue of APC.

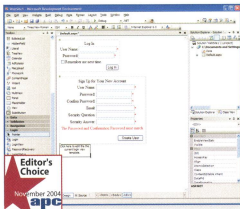


Details: Acer Altos G520

Contact	Acer
Phone	1300 769 601
Online	www.acer.com.au
Price	TBA
Intended market	Performance enthusiasts
✓	Solid performance.
✗	Reliance on DDR2 memory.
Verdict	★★★★★

Microsoft Visual Studio .NET 2005

Visual Studio.NET 2005 is in its near-final beta, with Microsoft touting it as a cornerstone of the eternally overdue Longhorn.



Code in a flash: ASP.NET 2.0 contains many new pre-built components and wizards to make Web site development quicker than ever.

.NET recap

For those new to the ideas behind .NET, Visual Studio .NET is Microsoft's suite of software development tools — Visual Basic, Visual C++, C# and J# — that target the .NET platform.

.NET, in turn, is the fusion of Windows- and Web-based programming technologies, featuring built-in support for memory management, database connectivity and wireless and palm devices.

Whereas previous programming languages would generate pure machine code to be executed directly by a microprocessor, the .NET languages generate an intermediate binary language known as MSIL (Microsoft Intermediate Language). The MSIL code is then executed on top of the .NET runtime libraries.

The benefit of this is that the .NET languages can access all of the functionality provided by the .NET class libraries, user interface components and utility routines. Together, all these items constitute the .NET framework.

With so much publicity surrounding XP Service Pack 2, the first public sighting of Visual Studio .NET 2005 might have escaped notice. The upcoming release of VS.NET 2005 (codenamed Whidbey) is an essential block in Microsoft's emerging software strategy and direction, the pinnacle of which will be Longhorn, the next version of Windows.

THE LONGHORN CONNECTION

Of necessity, Longhorn will support the current crop of Windows applications that use

the Win32 and previous APIs. It will also have an entirely new set of subsystems and programming models which can be only exploited fully through version two of the .NET framework, called WinFX. That's where Whidbey comes in: the really useful Longhorn apps will need to be WinFX programs.

Longhorn has three major pillars — Avalon, Indigo and WinFX — which relate to user interaction, communications and file storage, respectively. Microsoft is putting these three components forwards as revolutionary changes which will make Longhorn a radical leap from Windows. Yet code libraries for these pillars are only available in WinFX, which requires .NET version 2, and that in turn requires Whidbey. Even now, Microsoft is encouraging developers to get their hands on Whidbey and to switch to .NET, repeating the mantra that this is the future of Windows software development.

Clearly, the futures of Longhorn and Whidbey — and their success — are intertwined. To help developers get with the program, Microsoft has even announced free versions of the Whidbey components under the banner "Express". Beta Express tools are already available for download from <http://lab.msdn.microsoft.com/express>.

WHAT'S NEW?

Whidbey contains a wealth of worthwhile new features. At the IDE level, windows, menus, toolbars and even keyboard shortcuts can be carefully arranged and then saved as named configurations. These settings can be imported and exported, and thus transported from one

Whidbey setup to another. The first time Whidbey is started, it prompts for a selection from a list of predefined settings that reflect past IDEs and assist with the transition from previous environments.

The editor has been subtly enhanced with an incredibly handy feature — line revision marks. Any code edited in a session is visually indicated in the margin. Lines that have been edited or lines adjacent to deleted lines are marked. When the margin is highlighted yellow, this means that the line was edited and the file has yet to be saved. If the margin is highlighted green, it means the line was edited before the last save pass.

Navigating documents is much easier with new tag navigators showing where the cursor is, in the current hierarchy. Using the tag outline feature, sections such as large tables can be collapsed and expanded. New temporary projects allow creation and experimentation without having to save.

Debugging is enhanced with Edit and Continue, although this is only available for Visual Basic. This feature permits VB code to be changed while debugging an application, and then to continue running the program with the mods in place. This allows errors to be rapidly fixed without needing to repeatedly go through the edit, compile, run sequence.

ASP.NET

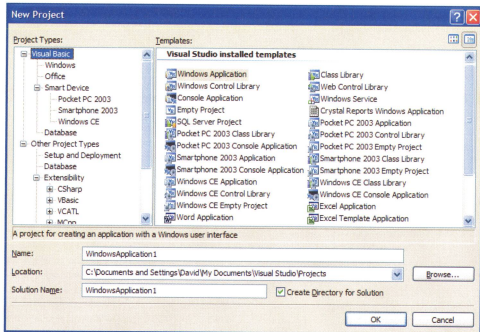
There are many further convenient touches like these, and in this regard Whidbey is a superb sequel. However, the really exciting developments are to be found in ASP.NET 2.0.

This Web-based aspect of Whidbey is also packed with brand new capabilities. The most visually prominent are the master detail pages, which allow a consistent layout to be applied to an entire ASP.NET site. The master detail page is laid out with panels and other artefacts and this is essentially stamped onto every subsequent Web form in the project. Change the master detail page and the rest of the site follows suit.

There's also support for internationalisation and a swag of new pre-supplied components, including a Web-based login box. Now, more than ever before, secure data-driven Web apps can be built by dragging and dropping, and setting a few properties.

FORWARDS ONLY

One important thing to note is that Whidbey is not forwards compatible. Whether this is good or bad depends on the situation. To be clear on the



Tools out: Visual Studio .NET 2005 has more projects than a home renovation show.

semantics, Whidbey is backwards compatible — a .NET 1.1 app will run on the .NET 2.0 framework. However, a .NET 2.0 app that only uses v1.1 features will not run on the .NET 1.1 framework. This marks a departure from Visual Studio.NET 2003, where a 1.1 application that only used version 1.0 features still ran well on the .NET 1.0 framework.

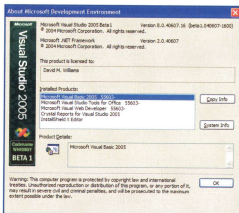
However, it's not possible to make a Whidbey-compiled app run on .NET 1.1. Whidbey-compiled components wouldn't work either, which means any developer who has to support previous .NET installations can't take advantage of the new Visual Studio IDE; they must continue to work in an older version of Visual Studio.

THE CRUNCH

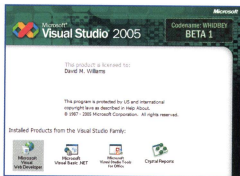
Visual Studio.NET 2005, like its predecessor, looks to be a solid, high-quality development suite for writing a variety of full-featured Windows and Web-based applications. Those new to .NET, or programming in general, will find it an excellent platform.

Existing Visual Studio.NET developers may find that the IDE and editing enhancements aren't enough to entice them to part with their money, but Whidbey has the dual king-hitters of ASP.NET 2.0 and Longhorn on its side. With a lack of competing tools, Visual Studio.NET 2005 is the only means of entry to those technologies. It's a pretty fair bet that Win32 is on its way out.

David Williams



Whidbey laid bare: Visual Studio's Help/About dialog shows installed packages and versions.



No secrets: Visual Studio's splash screen boldly proclaims the Whidbey moniker.

IBM's take

Microsoft isn't the only enterprise-level producer of software development tools — IBM has its meaty, Java-powered WebSphere studio. Weighing in on top of the proven J2EE, WebSphere has a lot of ground and can take advantage of Java libraries and components being produced worldwide on many different platforms.

On the one hand, WebSphere is platform independent. If an app must integrate with any data source, with a minimum of code modification, then WebSphere, through JDBC, offers a lot of punch.

On the other hand, if an app wants to be the best Windows app it can possibly be, Java runs into limitations because it can never, by design, eke out the bleeding edge from any platform.

Microsoft makes it clear that the future of Windows development is WinFX, and a new acronym has sprung to cover "WILY" programmers — those working with Whidbey, Indigo, Longhorn and Yukon (a codename for the next version of SQL Server). This is Microsoft's road map for the future and the pragmatic professional programmer simply can't afford to ignore it.

Details

Contact	Microsoft
Phone	13 20 58
Online	www.microsoft.com/vstudio
Price	TBA; Express line, free
Intended market	Consumer; business
✓	Excellent editor and IDE enhancements.
✗	Yet another API in WinFX; apps won't run on previous .NET frameworks.
Verdict	★★★★★

Unwired

A wireless ISP that offers acceptable speeds with pricing close to ADSL? Sounds too good to be true.



Thumbs up: behind the unassuming curves lies a state-of-the-art wireless broadband modem.

Inside info

- Unwired wireless broadband
www.unwired.com.au
- iBurst wireless broadband
www.iburst.com.au
- Whirlpool's wireless broadband forum
www.apcmag.com/info/WPWireless

Details

Contact	Unwired
Phone	1300 761 881
Online	www.unwired.com.au
Price	Plans from \$34.95 to \$119 per month; modem \$189 plus \$6 delivery
Intended market	Everyone
✓	Better price than any other mobile data service.
✗	Coverage only in Sydney.
Verdict	★★★★★

Unwired has leapt from the blocks with an aggressive advertising campaign to drum up interest in its wireless broadband service. It now covers a million people in Sydney, and the company has bought up spectrum worth \$170 million for a nationwide rollout of the wireless broadband technology in coming months.

The company's network is built with Navini Ripwave wireless technology which, unlike Wi-Fi, doesn't need line of sight between the base station and the receiver. Instead, the signal is bounced off buildings, and the transmitting base station automatically adjusts signal timing so signals still arrive in sync. Read more about how Unwired works at www.apcmag.com/info/Navini.

The modem for the service is a Navini Networks Ripwave 3500E, which Unwired sells for \$189 (plus \$6 delivery) when you sign up for one of its plans. Simply plug the Ethernet cable into your PC and the modem, and you're away — no configuration needed. The modem has a 30-day money back guarantee.

The first time you try to use your Web browser, Unwired redirects any URL requests to its plan sign-up page. It's a straight modem, so in its basic state only one computer can have "wireless Internet". If you want to share Internet access, you'll need a separate Ethernet or Wi-Fi router.

In addition to a normal power brick, there's an optional Lithium-ion battery pack (\$99), which yielded one hour and 30 minutes of power for the modem in testing. An Internet radio station was streamed for the duration, but given that the modem reduces power when not sending or receiving, you can expect better battery life with low-volume Web browsing and email.

WELL SPECCED

The flip-up antenna at the front of the modem is one of three built into the unit. The other two are flat "patch panel"-type antennae hidden in the sides of the modem. The 3500E uses whichever antenna has the strongest signal.

There are only two ports on the back of the modem — power and Ethernet. In testing, the power plug fell out easily when the device was moved. An Unwired spokesperson said this issue had already been identified as a manufacturing flaw concerning 2% of the first production run of the modems and that affected customers can get a free replacement power cord.

A third, blanked-out port is present for the connection of a standard telephone RJ45 jack — a clue as to how Unwired's yet-to-be-released Voice over IP service will work. (The company plans to launch a wireless phone service early next year using its network, but is still testing the system and developing a billing platform.)

First-generation Unwired modems will have to use a SIP ATA (an analog phone to SIP Voice over IP converter box) which will plug into the modem. A spokesperson for the company couldn't confirm whether future Unwired modems would come with direct phone inputs, but the presence of the blanked out RJ45 jack suggests they will.

Unwired offers a variety of plans, ranging from its top-of-the-line 1Mbit/s "Unleashed" plan, which costs \$119 per month and comes with 10GB of included downloads, to its cheapest plan at \$34.95 (256Kbit/s, 200MB). Between the two you'll find a range of plans offering different speeds and download limits. Unwired slows the service down to 64Kbit/s, which is slightly faster than dialup, once your download limit is reached.

Other providers will also be reselling Unwired with even more attractive pricing. ExeTel (www.exetel.com.au), for instance, has announced plans that include one at \$55 for 10GB (512Kbit/s) — \$35 below Unwired's comparable offering — and another with a 30GB download limit for power users.

PERFORMANCE

The Unwired network is fast and responsive on the whole. Ping times in CBD Sydney to a fast local server were consistently in the range of 113 to 143ms. However, no connection could be made in the inner Sydney suburb of Glebe at all, even though it is in Unwired's coverage area.

The maximum download speed possible on a 1Mbit/s service should be around 125Kbit/s, but we were able to download from fast servers such as Microsoft and Apple at sustained rates of around 135Kbit/s. To attain these speeds, LeechGet — a download manager which splits a download into a number of parts and sends them simultaneously to get the most out of your connection speed — was used.

Using a single download stream, speeds fluctuated from around 35Kbit/s to 100Kbit/s — not bad compared to ADSL, and given the unpredictable nature of Internet congestion. The speed fluctuated depending on the position of the modem, so the wireless network link isn't as rock solid as say, Optus Cable, but will be welcome for people who can't otherwise get broadband.

Dan Warne

SONY

Work faster with
the new 16X DVD burner.



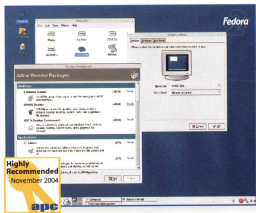
The one thing the new Sony 710 series won't burn is your time. With up to 16x burning speed, it's almost twice as fast as the previous Sony model. Available in internal IDE and external (USB2.0/link versions), it supports +/- formats and dual layer media. For information call 1300 13 SONY or visit sony.com.au

IT'S A SONY

Dual RW Drive
Double Layer

Fedora Core 2

The second release of Red Hat's freeware OS impresses.



Configuration: simple GUI tools can be used to add/remove software and change display settings.

Debian

Debian has a reputation as the Linux power user's distro. Although many consider its package management system superior to Fedora's, Debian is neither as user-friendly nor up-to-date. Download it from www.debian.org/distrib.

Mandrake

Mandrake is another good Linux alternative for home users, and is similar to Fedora. It's full of features and is easy to install and use, making it one of the most popular distributions available. Download it from www.mandrakelinux.com/en/ftp.php3.

Details

Contact	The Fedora Project
Online	http://fedora.redhat.com
Price	Free
Intended market	Consumer; business
✓	Up-to-date; works with most modern systems.
✗	No tech support provided by vendor.
Verdict	★★★★☆

Earlier this year, Red Hat, one of the longest standing and best-known Linux distributions, decided to split its Linux offerings. The result was a line of commercial products aimed at the enterprise market and Fedora, an unsupported freeware version.

Fedora doubles as a testing ground for new features before inclusion in commercial builds.

The Fedora Project forms a collective of Red Hat sponsorship and open source supporters who combine to trial new features and technologies that may end up in Red Hat's enterprise versions.

INSTALLATION AND PERFORMANCE

The DVD ISO image (or four CD ISO images) for Fedora Core 2 can be downloaded from <http://fedora.redhat.com/download>.

Installation is fast and can be done via a GUI tool called Anaconda. Boot straight from the CD/DVD. If you choose an interactive install (text or graphical), you'll be prompted for each step. Fedora Core 2 even checks the integrity of your media before install so you won't get halfway through and find that a CD didn't burn correctly.

As Fedora installs, hardware is detected and configured, and appropriate file systems are created for your architecture. You can manually partition disks and so on, or Anaconda can make decisions for you. Use a scripted install if you favour an unattended operation or multiple systems with a standardised install. A basic firewall using *iptables* is configured on installation.

The latest enterprise version of Red Hat (version 3.0) runs kernel version 2.4.21, gcc 3.2 and KDE 3.1.3. In comparison, Fedora Core 2 has copious improvements and new versions of packages and plug-ins, including kernel 2.6.5 with improved performance, scalability and device support, gcc 3.4, GNOME 2.6.0 and KDE 3.2.2. The 2.6 kernel has many integrated improvements over 2.4, including the new *SG_IO* mechanism which assists applications in sending commands to storage devices such as CD burners.

UPDATES

XFree86 X11 has been replaced with the new X11R6.7.0 X Window System release; a

combination of XFree86 4.4.0rc2 and the previous official X11R6 release plus some updates.

Version 1.0.2 is included as an improved Modern Version Control System designed to replace CVS. Kudzu hardware detection software is integrated into Core 2. Kudzu auto-detects new devices on startup and Core 2 includes basic drivers for most popular hardware.

There are countless improvements in Fedora Core 2 (see <http://fedora.redhat.com> for a full package list) which increase performance and make configuration easier. Programs load quickly and GUIs are available for common tasks such as printing, network setup and software installation. Better yet, the GUIs simplify most tasks without the loss of functionality that often comes from wizards. Everything can still be done manually if preferred.

The operating system ran well on the test machine — a 2GHz Pentium 4 with 512MB of RAM, and remained stable during testing. There is no built-in MP3 support, avoiding copyright complications. Adding this functionality is simple, however. MP3 plug-ins can be added for XMMS (included on this month's cover CD set), Rhythmbox (<http://home.gnome.com/greg/linux/fc2-tips.php>) and KDE (www.holovaty.com/linux/fedorafaq/kde_mp3.html).

Package management is also very good. The well-known and widely distributed RPMs work well, either via a GUI install or simple command line. Go to <http://freshrpms.net> for pre-compiled binary versions of most software versions tailored for your system.

SECURITY AND SUPPORT

A GUI tool for establishing a simple on-off (replacing low-med-high) firewall on install is a welcome feature and establishes a good security base. Firewall security is improved, and supports NIS, NFS and DNS without customisation.

Core 2 comes with a disabled version of Security Enhanced (SE) Linux. Advanced users can enable this, but caution is advised. Documentation can be found online at <http://people.redhat.com/kwade/fedora-docs/selinux-faq-en>.

Users may be concerned about the lack of dedicated support being available when things go wrong. One of the beauties of Fedora's popularity is that there are numerous help pages available, many contributed by advanced users.

The functionality of Core 2 makes it ideal for use by small businesses. It's a very stable, feature-packed release and is highly recommended for the budding Linux user.

Anton Tomazin and Caroline Leming

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ATI Radeon X800 Pro versus Nvidia GeForce 6800GT



Details:

ATI Radeon X800 Pro

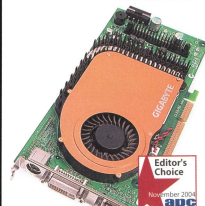
Contact Altech
Phone (02) 9735 5655
Online www.altech.com.au
Price \$760

Intended market Performance enthusiast

Extremely fast.

No Pixel Shader 3 support.

Verdict ★★★★★



Details:

Nvidia GeForce 6800GT

Contact Synnex
Phone 1300 880 038
Online www.synnex.com.au
Price TBA

Intended market Performance enthusiast

Ultra fast.

Little support for Pixel Shader 3 in current games.

Verdict ★★★★★

The latest ATI and Nvidia mid-range gamer cards go head-to-head.

Video card giants Nvidia and ATI have been battling it out in the gamer market for years. With titles such as Doom 3 and the overdue Half-Life 2 set to push graphics technology to the limits, it's time for the next battle in the 3D card wars.

ATI looked like it was on a winner with the release of the X800 range — the upgrade to its phenomenally successful 9800 range — earlier this year. The new cards boast core and memory clock speed increases of 25% and 32% respectively and this combined with two extra pipelines in the vertex shader (bringing the total to six) and four extra pixel pipelines (bringing the total to 12) helps the X800 offer blistering performance in DirectX8 and 9 games.

Nvidia wasn't to be outdone, revising its GeForce 6800 plans and deploying the 6800GT and 6800 Ultra lines. The Nvidia GeForce 6800 series cards feature 16 pixel pipelines, up from eight in the GeForce FX range. Two pixel shading units operate in a "superscalar" mode, enabling the 6800 to work on two textures simultaneously.

Technically, the 6800 series has the advantage thanks to full Pixel Shader 3 compatibility. A patch for the popular game Far Cry has enabled Pixel Shader 3 operations that deliver increased performance from suitably optimised software. Expect to see more applications supporting Pixel Shader 3 in the near future.

But never mind the future, which card is better now? Loaded with 256MB of GDDR3 and an 8x AGP connection, APC Labs put Gigabyte's GV-N68T256D 6800GT and XpertVision's Radeon X800 Pro through their paces.

ON THE TEST BENCH

Head-to-head, there was very little to separate the cards across all benchmarks. Both were tested on the same Athlon XP 2800+ with 512MB of Kingston ValueRAM PC3200 running Windows XP Professional SP2. The Nvidia GeForce 6800GT squeezed out 9,812 in 3DMark2003, just edging out the ATI's X800 Pro's score of 9,393.

Aquamark is an effective benchmark suite designed to stress video cards in a similar manner to current generation PC games. Once again, the Nvidia 6800GT narrowly beat the ATI X800 Pro, scoring 48,507 and 45,454 respectively — a lead of about 6% over the ATI card.

The SPECviewperf 7.1 OpenGL benchmark from Standard Performance Evaluation

Corporation was the next test on the bench. The most pertinent results, those obtained with the 3DSMax and Lightwave tests in rendering performance, show the cards are closely matched. The ATI X800 Pro scored 11.84 in the 3DSMax benchmark, compared to the 6800GT's 12.59. Lightwave showed a slight reversal with the X800 scoring 12.64 to the 6800's 12.45.

REAL WORLD

In real world testing using Doom 3, the performance difference becomes apparent. The cards were rigorously tested on a 3GHz Intel Pentium 4 (Northwood) with 512MB of Kingston ValueRAM PC3200 on a Gigabyte GA-8NXP Ultra 2 motherboard using both Doom 3's internal time demo utility and Fraps 2.2.5 (www.fraps.com) capture and DX9/OpenGL benchmarking utility. The demo was run three times to remove any lag due to disk loading activity. The system was set to run the tests in 1,024 x 768 at high quality.

The Nvidia 6800GT got an edge over the ATI X800 Pro in the time demo, posting a score of 32.3fps to the X800's 28.9fps.

The results show both cards are powerful enough to deal with any task thrown at them. For video editing, design, general use and power-hungry 3D gaming, both the ATI X800 Pro and the Nvidia 6800 GT shine.

Overall, though, the Nvidia is the better performer in benchmark tests, but the difference is less than 10% in most cases. The next major stress point for these cards will be the release of Half-Life 2.

Nick Race

Benchmarks

3DMark2003 Pro

0	Nvidia	9,812	20K
0	ATI	9,313	20K

Doom 3 (1,024 x 768 x 32-bit, high detail)

0	Nvidia	32.3 FPS	60
0	ATI	28.9 FPS	60

Aquamark

0	Nvidia	48,507	60K
0	ATI	45,454	60K

SPECviewperf 7.0.1 3DSMax

0	Nvidia	12.59	20
0	ATI	11.84	20

SPECviewperf 7.0.1 Lightwave

0	Nvidia	12.45	20
0	ATI	12.64	20

The Nvidia 6800GT edges out the ATI X800 Pro in most tests.

Netgear GS724T SmartSwitch

Netgear's GS724T SmartSwitch brings managed network features to a more affordable price bracket.

In large networks, proper management is integral to the performance of the greater WAN. However, flexibility, security and return on investment are major factors in the design of SME networks.

Netgear's GS724T has been designed to bridge the gap between large enterprise equipment and solutions catering to small business. The unit features 24 full-duplex Gigabit ports. The inclusion of two small form factor pluggable (SFP) GBIC ports allow LX or SX fibre modules to be installed for inter-switch connectivity for distances over 100m.

Switch management is done through a password protected Web interface, though specific IP addresses that should have management access can be defined. IP addresses are taken from a DHCP server running on the network by default, but static network configuration is possible.

Once logged in, the speed of each port can be set manually. Flow control can be enabled and disabled, and QoS priorities set.

The switch supports both 802.11q VLAN

tagging or port-based VLANs. With the latter, you may assign more than one port to each VLAN, giving you great flexibility in segregating areas of your network. Limited trunking support is also included — a maximum of four trunks may be configured (one for each group of six ports).

Some basic functions are missing, however there's no Spanning Tree Protection (STP) and the statistics leave a lot to be desired. The send or receive buffers report in terms of packets, not data volume. And while there's the facility to monitor ports using a Remote Monitoring (RMON) host, you're restricted to watching one port at a time. There's no SNMP support either.

The SmartSwitch is pretty noisy in operation, but desktop use is usually out of the question with the number of ports available. It's much better suited to mounting in a comms rack — thankfully, a rack-mount kit is included.

The GS724T is an excellent "set and forget" network solution. Just don't expect it to have the management features of top-shelf products.

Jarrold Spiga



Details

Contact	Netgear
Phone	1800 502 061
Online	www.netgear.com.au
Price	\$1,639
Intended market	Business
✓	Flexible VLANs; included rack-mount kit.
✗	No STP or SNMP; no statistical feedback.
Verdict	★★★★☆

At your side.
brother

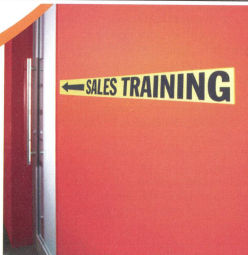
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Com-Tek CL-56

Com-Tek's desktop replacement shows solid performance and provides an argument for buying "white box" notebooks.



White supremacy: the CL-56 is a winner — whatever its label.

Details

Contact	Com-Tek Computers
Phone	(03) 9329 2388
Online	www.com-tek.com.au
Price	\$2,850
Intended market	Everyone
✓ Good performance; battery life.	
✗ One-year warranty as standard.	
Verdict	★★★★☆

Benchmarks

Multimedia Content Creation Winstone 2004

0 **21.7** 40

Business Winstone 2004

0 **20.4** 40

3DMark2001

0 **10,217** 20K

BatteryMark 4 (hr:min)

0 **2:30** 6:00

The CL-56 performs well across all benchmarks.

Big-name vendors aren't the only source of high-quality notebooks. Intel's promotion of the Centrino platform means that the technology has also filtered down to smaller brands. The white box notebook market is growing and offers outstanding value to buyers willing to stray from name brands. The same OEMs build for major notebook brands including Dell, IBM and Apple, so you're not buying substandard components.

The CL-56 is made by Clevo, a huge Taiwanese OEM, and sold in Australia by several vendors, including Com-Tek and DigitalStar.

And it's a screamer, with a 1.7GHz Dothan-core Pentium M processor, 1GB of DDR RAM and a 60GB hard disk.

This configuration from

Com-Tek retails for \$2,850, while a version with a 4x dual-format DVD burner sells for \$3,000. There's also a base configuration with 1.6GHz Dothan-core Pentium M processor, 512MB of DDR RAM and 40GB hard drive which retails for \$2,495. All configurations ship with a one-year warranty, though this can be extended to three years for \$285.

DigitalStar (www.digitalstar.com.au), a Com-Tek competitor, is also selling a version of the CL-56 as part of its PowerNote range. It ships with a 1.7GHz Pentium M processor, 512MB of DDR RAM, 60GB hard disk, combo drive, Windows XP Home and a two-year warranty for \$2,749.

Both machines feature SD/MMC and PC card slots, an infra-red port and three USB connectors. A single four-pin FireWire plug is present on the rear panel, alongside S-Video, 10/100 Ethernet, modem, parallel and VGA ports.

ADEQUATE GAMING

An ATI Mobility Radeon 9700 video adaptor drives the 15.1in screen, which runs at a native resolution of 1,400 x 1,050 pixels. The screen resolution is higher than most 17in desktop TFT panels, resulting in clear, crisp text and images. The screen is bright enough for outdoor use, though the contrast is a little low when testing with the Nokia Monitor

Test application. A low contrast display generally means substandard DVD playback as dark scenes lack detail, but the CL-56 manages this well.

The CL-56 is Centrino compliant, with its Pentium M processor, Intel Pro wireless adaptor and i855 chipset. As a result, it runs for two hours and 20 minutes under BatteryMark 4. This test places a heavy load on the machine during the rundown process, and the score indicates that it could easily last for over three hours of low-intensity tasks such as word processing or spreadsheet manipulation.

The CL-56 also powered through benchmark tests, scoring 20.4 under Business Winstone 2004 and 21.7 under Multimedia Content Creation Winstone 2004. These strong results indicate stellar performance for just about every task, and the machine's combination of raw power and large screen makes it ideal for those working with graphics applications or programming IDEs.

The beefy video card helped the Com-Tek unit to a score of 10,217 under 3DMark2001. It fared a little worse under 3DMark2003, with a score of 2,879. But this isn't surprising, as the latter test measures performance of DirectX9, which post-dates the Radeon 9700 engine.

Although the CL-56 gets warm along the right-hand edge during operation, it isn't uncomfortable to use.

Intel's Pro 2200BG wireless adaptor is bundled, along with a switch on the left-hand panel to physically disable it if required. This is a great option for mobile professionals as it enables offline work in busy environments, reducing the risk of hacking while also extending battery life.

FULL KEYBOARD

The CL-56's keyboard is comfortable to type on and features full-sized keys in the bottom right corner, making for an easy transition for touch typists coming from desktop keyboards.

Although the CL-56 tips the scales at just over 3kg and is relatively bulky, the large screen, ample specifications and solid performance make it ideal for the power user more interested in function than form. It includes just about every technology mobile users could want except Bluetooth, though infra-red is still present for those looking to connect to a mobile phone.

As an added sweetener, all models sold before the end of the year also ship with a multiuser Smart-Guard memory key, which usually retails for \$129 (reviewed APC July 2004, page 60).

Any way you slice it, the Com-Tek CL-56 offers outstanding value for money.

Matthew Overington

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RRP from \$999

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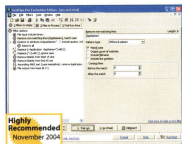
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TextPipe Pro 7



Highly Recommended
November 2004



Details

Contact	Crystal Software
Phone	(03) 9888 3104
Online	www.crystalsoftware.com.au
Price	US\$299. Quantity discounts, server licences and volume licences are available.
Intended market	Business
✓	Flexible extraction and conversion.
✗	Pattern matching is an art.
Verdict	★★★★☆

Data conversion and extraction tasks are easy with this industrial-strength utility.

When working on a large development project, it's not uncommon to find that you need to make a change that will affect many files at once. Currently, most developers would either open each document and make the changes manually, or even knock up a basic VBA script to accomplish the same task.

TextPipe Pro is a specialised tool for such tasks, whether the source and destination are text files, binary files or databases. It works by stringing together predefined filters to perform the desired transformation. The range of filters includes case conversion, CSV to XML, removing tags or elements, conversion to Unicode, and even special functions for dealing with emails, such as header removal or MIME decoding.

Most transformations are covered, but special requirements can be met by hooking an external program into the flow or by creating a custom filter in VBScript, JScript, VBA or PerlScript.

The scope of a filter can be limited to a subset of the data by making it subordinate to a "restrict" filter. Restrictions can be in terms of the physical

layout of the input (a column range or particular CSV fields, for instance), according to the data itself (such as lines matching a pattern), or text within a certain pair of HTML tags.

Flexibility is also provided when it comes to pattern matching. TextPipe Pro handles Perl, egrep, Brief, Word and EasyPattern formats. The first four will be welcomed by anyone already familiar with those applications, but EasyPattern lives up to its name: if you're looking for any two digits, you specify **2 digits**. If you need to match APC or Australian Personal Computer, the pattern is **APC[or]Australian Personal Computer**.

It's difficult to get the queries right at first, but a trial feature enables you to paste the contents of a file (or just an extract) and then view it and the filtered content side by side.

TextPipe Pro can handle multiple files in one run, optionally combining the output to a single file. Either way, results can be sent to the clipboard or to a new file(s), or they can replace the input files, keeping a backup copy.

Although it fills a niche, this elegant app will earn its keep wherever large quantities of data must be transformed on a regular or ad hoc basis.

Stephen Withers

PageQ Editor



A browser's delight, but the price may be difficult to justify.

Many people have a daily or weekly routine when it comes to visiting Web sites. Bookmarks handle this reasonably well, and some browsers can open a collection of bookmarks in one go — but what if you want to share the collection with others?

PageQ Editor is positioned as a combination of browser and media player. Building a "Q" (playlist) is easy. PageQ can access your Internet Explorer History and Favorites (even if Explorer isn't your default browser). Type URLs into the address bar, or follow links from the current page.

Separator pages can be inserted to organise the Q into sections and provide explanatory notes. Pages can be added, deleted, rearranged and disabled. While separators and pages can be arranged in trees, disabling an item doesn't disable its subordinates.

A completed Q can be published as an HTML file and saved to disk, sent as an email attachment or uploaded to an FTP server.

Published Qs can be played using Internet Explorer, Firefox and Safari, moving automatically from one page to the next. A toolbar displayed at the top of the window provides play, stop, advance and other buttons.

The Q preparation stage could do with some improvement for users of browsers other than IE, and the ability to easily disable entire branches of a Q's tree would be handy.

The more sites you visit frequently, the more useful you'll find PageQ. The Home and Professional editions are only offered to private and educational users. The modest cost of the Professional edition is justified by the convenience of the HTML publishing feature, but the Home licence permits Aspiring Software to email users with "informational/promotional/marketing material no more often than once a month for at least the first six month period".

The main advantages of the Business edition are that it allows custom branding of Qs and the removal of banner advertising. This makes it a useful vehicle for self-running Web-based presentations and other promotional material, but it is too expensive for everyday browsing.

Stephen Withers

Details

Contact	Aspiring Software
Online	www.pageq.com
Price	Home edition, free; Professional edition, US\$10-\$30 donation; Business edition, US\$139
Intended market	Everyone
✓	Useful for habitual surfing.
✗	Business edition pricey unless used for publishing.
Verdict	★★★★☆



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Sub-\$1,000 PCs

Who says you've got to spend big to get high performance?

Matthew Overington looks at three top performers under a grand.

With Christmas just around the corner, APC decided to look at a number of low-cost systems that would be at home in any high-performance household or workplace. As money is generally tight around this time of year, the system price limit was set at \$1,000, excluding mouse, keyboard and monitor. Although \$1,000 is an entry-level

price point for many buyers, shopping around can still net you a more than capable PC.

Some smaller vendors choose to position themselves as premium box builders or suppliers and prefer not to build to tight budget constraints. Many larger OEMs have limited high-performance offerings at a low cost. Performance and price aren't necessarily directly related, though, as these three machines prove. While not the latest and greatest, they are more than up to most tasks — even some gaming or video editing.



Altech Viper XP

Altech's Viper XP features an Athlon XP 2800+ matched to an ABIT NF7 motherboard and 512MB of DDR SDRAM. An LG DVD/CD-RW combo drive is also bundled, along with an ABIT ATI Radeon 9550 video card.

These specs look a little pedestrian next to the TI AMD Deluxe 999, and the Altech accordingly achieved slightly lower benchmark scores than the 64-bit system.

The Viper scored 25.6 under Multimedia Content Creation Winstone 2004 and 1,540 under 3DMark2003. The machine is definitely no slouch, but could use more RAM before attempting heavy processing loads. It ships with a copy of Windows XP Home.

Details

Contact	Altech
Phone	(02) 9282 8000
Online	www.altech.com.au
Price	\$999.95

✓ Stable, proven platform.

✗ Slower than the TI AMD Deluxe 999.

Verdict ★★★★★



Plus Aspect S45 SE

Plus Corporation supplied the first retail Sempron-based PC APC Labs has seen. The unit has a Sempron 3100+, 512MB of DDR SDRAM and an 80GB Seagate Barracuda hard disk.

The Aspect cruised through the standard benchmark suite, managing a creditable 25.2 under Multimedia Content Creation Winstone 2004.

The ageing Radeon 9200SE video card didn't do it any favours though, with a score of just 641 under 3DMark2003.

The capable processor and 512MB of RAM ensures this system will meet all the needs of a family or business PC. Provided you don't want to play any games, the Aspect is a great choice. Windows XP Home is supplied.

Details

Contact	Plus Corporation
Phone	1800 007 587
Online	www.pluscorp.com.au
Price	\$999

✓ 512MB of RAM.

✗ Slow video.

Verdict ★★★★★



TI AMD Deluxe 999

TI's AMD Deluxe 999 is an excellent example of the calibre of machine that can be built on a tight budget. TI installed an Athlon 64 3000+, ATI Radeon 9550 and 120GB Seagate Barracuda hard disk into this sub-\$1,000 PC. Granted, the vendor had to skimp on RAM — only fitting 256MB — but memory can easily be added later as funds allow.

The base system is extremely fast and will suffice as an entry-level gaming rig, let alone surfing the Net or running productivity suites. It scored 26.2 under Multimedia Content Creation Winstone 2004 and 1,639 under 3DMark2003. These are reasonable results, but more RAM would see this machine fly. Windows XP Home is supplied.

Details

Contact	Trinity International Computers
Phone	(02) 9437 5437
Online	www.ticomputers.com.au
Price	\$999

✓ 64-bit performance.

✗ 256MB of RAM.

Verdict ★★★★★

Build your own fast machine

Apple's Dual 2.5GHz PowerMac G5 retails for \$5,299 with 512MB of DDR SDRAM, a 160GB Serial ATA hard disk and no monitor. This is equal to the cost of five Athlon 64 systems from TI Computers (also without monitors), each fitted with a 120GB hard disk and 256MB of DDR SDRAM.

Savvy builders could connect the PCs to a Gigabit Ethernet hub. The system architect could then install Linux, clustering software and, with a little tinkering, build an extremely fast grid computer. Although few would need the raw power offered by this setup, the level of processing performance achieved by the array of Athlon 64s far outstrips the fastest dual-processor G5s. Inexpensive 64-bit clusters offer exceptional processing performance per dollar spent.

As prices fall, this sort of setup could grow in popularity, especially when tremendous processing power is required.



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Wide-screen notebooks

Nick Race and Matthew Overington put four top wide-screen notebooks side by side.

As the quality of LCD panels improves, notebook computers of all shapes and sizes benefit from larger and clearer screens. Like their desktop brethren, the screens of portable computers are getting wider, rather than expanding in the usual 4:3 aspect ratio of a PC monitor. Matching the shape of the screen to the keyboard enables manufacturers to minimise wasted space.

Notebooks are popular media playback devices — on a long flight, for instance, the DVD capability of a notebook can be a fantastic sanity saver. But notebooks are primarily business tools and a screen with a 16:9 aspect ratio is also very useful in this environment. Being able to compare two documents side by side is useful for sales presentations, to give just one example.

The notebooks on test here range from 1.6kg ultra-portables to 3kg desknotes, but all feature high-quality, high-resolution LCD screens.

Acer Aspire 1680



Acer's corporate-styled Aspire 1680 is a sleek machine. The base model features a 1.5GHz Pentium M processor, 256MB of RAM and a 15in screen running at 1,280 x 800 pixels.

At a little over 3kg, the Aspire's not suited to a lot of movement, but it's a multimedia enthusiast's dream. It features USB and infra-red ports on the front panel, along with status LEDs.

Despite its generally unremarkable specs, the Acer blizzards the benchmark tests, managing 10,732 under 3DMark2001 SE Pro, 17.1 in Multimedia Content Creation 2004 and 18.2 in Business Winstone 2004. Battery life is good for a large unit at two hours and 30 minutes in BatteryMark 4.

Details

Contact	Acer
Phone	1300 366 567
Online	www.acer.com.au
Price	\$2,699
✓	Good performance.
✗	Heavy.
Verdict	★★★★☆

BenQ Joybook 6000N



The ultra-portable 1.6kg BenQ Joybook 6000N features an Intel Pentium M 1.6GHz processor, a 12.1in 1,280 x 800 resolution screen and a multitude of connectivity options including FireWire, modem, Ethernet, Bluetooth and two USB 2.0 ports. It also has a 40GB hard disk drive, 512MB of RAM and an external DVD/CD-RW combo drive.

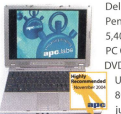
The Joybook's screen is clear and bright, and the keyboard is a bit cramped but usable.

Benchmarks of 18.6 in Business Winstone 2004, 2,334 in 3DMark2001 and 20.1 in Multimedia Content Creation are excellent. Battery life was recorded at two hours and 39 minutes in BatteryMark 4.

Details

Contact	BenQ
Phone	(02) 9714 6800
Online	www.benq.com.au
Price	\$3,199
✓	Ultra small; powerful.
✗	Cramped keyboard.
Verdict	★★★★☆

Dell Inspiron 700m



Dell's Inspiron 700m features a 1.8GHz Pentium M processor, 1GB of RAM and an 80GB 5,400rpm hard disk. The unit includes SD and PC Card readers, VGA and S-Video outputs, DVD+R/RW drive, a FireWire connector and two USB 2.0 ports, along with 10/100 Ethernet, 802.11g Wi-Fi and a 56k modem. It weighs just 1.9kg, with a clear 12.1in screen running

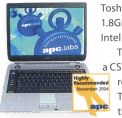
at a native resolution of 1,280 x 800 pixels.

The machine managed stellar benchmark results: 21.2 under Business Winstone 2004 and 24.7 in Multimedia Content Creation Winstone 2004. But its score of 2,462 under 3DMark2001 is below par and the four-cell battery can only achieve one hour and 39 minutes under BatteryMark 4.

Details

Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	\$3,399
✓	Light; stylish; powerful.
✗	Poor battery life with four-cell battery.
Verdict	★★★★☆

Toshiba Satellite M30



Toshiba's 2.8kg Satellite M30 is based on a 1.8GHz Pentium M CPU and 512MB of RAM. An Intel PRO/Wireless 2,200GB adaptor adds Wi-Fi.

The 15.4in, 1,280 x 800 resolution screen has a CSV (Clear Super View) coat which minimises reflection without diminishing brightness.

The unit features parallel, S-Video, FireWire, three USB 2.0, Ethernet and modem ports.

An 80GB hard disk drive and built-in DVD-RW burner are also supplied.

Benchmark results are best described as mixed: scores of 20.6 in Business Winstone 2004 and 6,946 in 3DMark2001 are good, but the M30 couldn't complete the Multimedia Content Creation test. Battery life was three hours and seven minutes in BatteryMark 4.

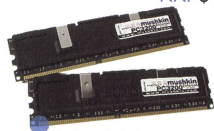
Details

Contact	Toshiba
Phone	13 30 70
Online	www.isd.toshiba.com.au
Price	\$4,299
✓	Clear, bright screen; powerful.
✗	Heavy.
Verdict	★★★★☆

XSONIC



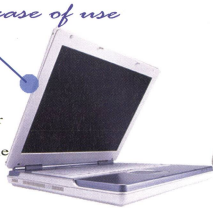
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What if every note you ever took was saveable, searchable and sendable?

OBSERVATION: Many highly efficient people pour their daily output into two incompatible receptacles: all documents, spreadsheets and presos go into a computer, while handwritten notes disappear into pads, filing cabinets and mountainous piles. This, frankly, is highly inefficient.

SUGGESTION: Imagine a system that stored every scribble, note and doodle, and enabled you to find those ideas, insights and other handwritten gems days or months later, and do so in seconds. Sound more efficient? Then perhaps you should be working on Toshiba's latest Tablet PC.

PAYOFF: The Portégé M200 is a convertible, so you still have a fully functional notebook computer powered by Intel® Centrino™ Mobile Technology. But where once you'd have picked up pad and pen to make notes, now you convert to tablet mode and pick up the stylus. You can then write directly into Microsoft® OneNote (a powerful note management program, bundled on the latest Toshiba mobile computers). OneNote auto-saves every stroke of the stylus and allows you to search by date, name, content, scribble and more. In the past, you might have wasted hours looking for notes, numbers or minutes. Now your daily intellectual output is stored in one place, and remains accessible anywhere, at any time.

ACTION: For more info or to organise a demo, see your nearest Toshiba Authorised Reseller, visit www.isd.toshiba.com.au/tabletpc or you can call 13 30 70.

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HIGHLIGHTS: Intel® Pentium® M processor 1.6 GHz provides the power to make digital ink look – and flow – like the real thing. World's first 12.1" SXGA+ screen (1400 x 1050 resolution) provides exceptional detail and a large work area – almost A4 in size. The latest nVIDIA® GeForce™ FX Go5200 chipset provides industry-leading graphics performance and exceptional handwriting detail.

Toshiba recommends Microsoft® Windows® XP Tablet PC Edition for Mobile Computing.



Sub-\$4,000 power systems

How we tested

All PCs were tested with a suite of five benchmarks designed to stress the machines in a similar manner to the demands of video editing. Cinebench 2003 was used to evaluate 3D scene rendering using CPU-based OpenGL algorithms. Cinebench 2003 G5 Beta was used on the Apple G5 desktop. Futuremark's PCMark tests a PC's ability in graphics, disk subsystems, memory transfers and CPU power. Multimedia Content Creation Winstone was run on all machines, giving an indication of video and audio editing capability. Futuremark's 3DMark2003 shows the graphics card performance. Lastly, a Doom 3 time demo, demo1, was run to give a relative performance of the CPU and graphics card in tandem. Doom 3 tests were run twice to eliminate effects from disk loading. Scoring is based on build quality, warranty, performance (including benchmarks) and suitability for video editing.

Whether it's video editing, graphic design or extreme gaming, **Nick Race** and **Matthew Overington** check out 10 systems designed with multimedia in mind.

As still image megapixel counts increase on digital video cameras, many consumers are finding they no longer need both a camcorder and digital camera as one device now fulfils both functions. With Christmas and the school holidays fast approaching, APC invited 10 vendors to submit purpose-built multimedia PCs for comparison.

The submissions to this Labs Challenge are really a showcase for new PC technology, with Intel-based systems running on Socket 775 motherboards and processors, and a large number of vendors spec'ing up Athlon 64-based units. The 64-bit platform is a good choice for anyone building up a multimedia workstation, as the extra headroom of the 64-bit processor provides plenty of power for tasks requiring lots of complex computation.

These machines are all true multimedia powerhouses, equally up to the task of rendering video streams with multiple real time effects, playing a few rounds of Doom 3 or editing a musical masterpiece.

The price ceiling for the roundup was set at \$4,000, including a monitor. While this is a substantial sum for a new PC, it also represents excellent value for money. These days, this amount buys a lot of quality PC hardware and offers plenty of room to spec up fast disk systems, beefy video cards and DVD writers.

Modern processors are fast enough to handle video processing, but it's important to have plenty of RAM and fast disk systems. RAID is expected at this price level, ensuring no frames are dropped when data is read from or written to the disk. DVD writers are essential.

Surprisingly, a few systems in the roundup shipped without a dedicated soundcard. This is unforgivable in a computer that will be used for editing multimedia content. Good audio is crucial to producing watchable movies, and there's little point in mixing songs through onboard sound processors, as the low signal-to-noise ratio means your finished work will be full of pops and clicks.

Several systems in the roundup have Windows XP Home installed. Due to its lack of advanced network support, this is a poor choice for machines in a business environment. However, this OS is acceptable for a multimedia editing system that will be used in the home or as a dedicated production station.

Which video editing software you choose depends on your needs and experience. While beginners may find Adobe Premiere Pro a little daunting, old hands will feel limited by Windows Movie Maker 2. Shop around for a suitable package and spend some time playing around with the free editor that ships with Windows XP to figure out what features are important to you.



Acer Aspire T310

Acer's entry to this Labs Challenge is a little disappointing. Although it features top-shelf hardware, it fails to perform as an all-round multimedia PC.

The base hardware is certainly solid, comprising a 3.4GHz Pentium 4 processor, 2GB of PC3200 RAM, 200GB Seagate Barracuda hard disk and a single OptoRite DD1205 DVD±RW burner. And the T310 is one of the few machines in this Labs Challenge have a dedicated soundcard — a Sound Blaster Audigy 2 ZS. This offers great audio and frees up CPU resources for editing.

Despite the solid specs, the Aspire T310 can only manage a paltry 24.6 in Multimedia Content Creation Winstone 2004, and falls just short of

4,000 in PCMark04. These scores are well below some of the other marks set by hardware that appears, on the surface, less capable.

On the other hand, the T310's wide-screen display is a superb inclusion. Not only is it excellent for watching DVDs, it's great for editing as it allows the user to work with a long timeline. Buyers looking specifically for a wide-screen display would be well advised to add a second 200GB hard disk in a RAID configuration to boost performance.

Windows XP Home is bundled, along with a meagre smattering of software. Acer provides the T310 with a 12-month onsite warranty, which goes some way to offering peace of mind on what is a relatively large investment.

Details

Contact	Acer
Phone	1300 366 567
Online	www.acer.com.au
Price	\$3,999
✓	Powerful hardware.
✗	Single hard disk.
Verdict	★★★★☆

Altech Spielberg

Altech's submission is an adequate multimedia machine, let down by the fact that it doesn't include a dedicated soundcard.

An AMD Athlon 64 3500+ on an ABIT AV8 motherboard is matched to 1GB of PC3200 RAM. Three hard disks are installed: two 200GB Seagate Barracuda 7200.7 drives in a RAID array and a single 80GB Parallel ATA Maxtor DiamondMax drive. This offers blistering speed and is ideal for editing large DV streams. An AVerMedia DVD EZMaster Gold TV tuner card also features.

Two 19in Samsung Dynafat 957DF CRT monitors are offered as part of the package. The dual-screen combo enables you to preview your edits on one screen while using the other for editing, and represents great value.

The onboard processor offers a low signal-to-noise ratio, and also ties up CPU resources when processing sound. A 256MB XpertVision ATI Radeon X800 PRO video card is used, driving the system to a score of 68.3fps under Doom 3.

The Spielberg achieves reasonable results in benchmark tests, scoring 31.7 under Multimedia Content Creation Winstone 2004, 356 in Cinebench Shading (CINEMA 4D) and 4,301 under PCMark04. These marks are a little down on the rest of the pack, but strong nonetheless.

Windows XP Home is bundled, and the two-year return to base warranty offers ample security in case anything goes wrong.

The Spielberg is a compelling machine, but a dedicated soundcard would increase its score.



Details

Contact	Altech
Phone	(02) 9735 5655
Online	www.altech.com.au
Price	\$3,999

✓ Ample storage.

✗ No dedicated soundcard.

Verdict ★★★★★

Dell Dimension 8400

Although many buyers would think twice before picking up a brand-name PC for demanding tasks like video or audio editing, Dell has proven that the big guys can mix it with the smaller players which take pride in tailoring solutions to suit the needs of individual customer.

Dell's submission features a 3.6GHz Pentium 4 processor matched to 1GB of DDR-2 RAM and a single 160GB Serial ATA WD1600JD Western Digital hard disk. Buyers looking for a modest performance boost are advised to drop another identical drive into the system and configure a RAID array. In this case, however, the Dell's performance doesn't suffer.

The system also employs an ATI Radeon X800 XT video card and a Sound Blaster Audigy 2

soundcard. This combo maximises frame rates for gaming while minimising CPU load. Dual optical drives are fitted, including a DVD+RW burner and Sony CD-RW, enabling disc-to-disc transfers.

Unsurprisingly, the Dimension 8400 absolutely blew the competition away in PCMark04 benchmarking, scoring a staggering 5,559. The other benchmark scores were closer to the pack, with the Dell managing a record 402 under Cinebench (CINEMA 4D), 30.7 under Multimedia Content Creation Winstone 2004 and 61.6fps in Doom 3. The only gripe with the system is the 17in TFT monitor — too small for multimedia.

A one-year onsite warranty rounds out the package, which ships with a copy of Windows XP Professional and Dell's software suite.



Details

Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	\$3,899

✓ Fast; well-appointed.

✗ No RAID array.

Verdict ★★★★★

Apple Dual 1.8GHz PowerMac G5

Traditionally, the Mac has been the platform of choice for prosumer video editors. But with a range of compelling applications as well as cross-platform compatibility, PC enthusiasts looking to edit video will be right at home on the Mac too.

Apple's entry-level dual G5 has two 1.8GHz PowerPC processors mated to 256MB of RAM and an 80GB Serial ATA hard disk. It retails for \$3,599 without a monitor, but the G5 is a pleasure to use.

The system performs well under benchmarking — managing 251 under Cinebench — but it's below the Windows units. It also scored 184.64 under Xbench 1.1.3, indicating strong performance across a range of Mac applications. Although performance is

acceptable, an upgrade to 512MB or even 1GB of RAM would see improvements in raw speed.

While the PCs in this Labs Challenge ship with high-end video cards, the G5 included an ageing Nvidia GeForce FX 5200 Ultra with only 64MB of memory. Although few games for the Mac demand a beefy video card, this is an Achilles heel in an otherwise high-performance system.

The Mac ships with a rich suite of apps, including iLife '04, FileMaker Pro Trial, OmniGraffle, OmniOutliner, GraphicConverter, Safari, QuickTime, iChat, iCal, iSync, DVD Player, Mail, Acrobat Reader, Classic environment and Apple Developer Tools. A one-year RTB warranty is included, along with 90 days of phone support.



Details

Contact	Apple
Phone	13 36 22
Online	www.apple.com.au
Price	\$3,599

✓ Powerful, responsive system.

✗ Paltry RAM; ageing video card.

Verdict ★★★★★



Details

Contact	Emagen
Phone	1300 880 070
Online	www.emagen.com.au
Price	\$3,999

✓ Good video card; fast hard drives.

✗ 17in monitor.

Verdict ★★★★★



Details

Contact	Marvel
Phone	(02) 9680 9688
Online	www.marvelcomputers.com.au
Price	\$3,995

✓ Large, fast disks.

✗ Meagre software suite; 17in screen.

Verdict ★★★★★



Details

Contact	PC Quest
Phone	1300 550 118
Online	www.pcquest.com.au
Price	\$3,899

✓ Top-end video capture; Double Layer burner; solid software offering.

✗ Heat issues.

Verdict ★★★★★

Emagen Lightspeed DV

Housed in a sleek Cooler Master Praetorian case, Emagen's Lightspeed DV is neatly finished, with clear airflow and plenty of room for expansion.

Based on an AMD Athlon 64 3800+ CPU on an ASUS A8V Deluxe motherboard, the Lightspeed DV chews through CPU-intensive operations with ease. The system sports 1GB of PC3200 RAM, a 36GB 10,000rpm Serial ATA Western Digital Raptor hard drive plus two Western Digital 7,200rpm Serial ATA drives in a RAID 0 array. A Sony DVD±RW drive is included for backup and output while a Creative Audigy 2 ZS card manages the audio.

Video is taken care of with a dual DVI output FX5700-VT2DR256 video card from MSI — a great choice for a video editing PC thanks to the video in/video out (VIVO) capability from an onboard

Philips video decoder chipset. The card also features a single S-Video connector.

A 17in Samsung 172 x 12ms LCD panel is also bundled with the PC. The monitor offers the speed required for working with video, though a little more screen real estate would be beneficial.

Respectable scores are achieved across all benchmarks. These include 330 in Cinebench and a very good 31 under Multimedia Content Creation. PCMark04 clocks the Emagen system at 4,390. These results show the Lightspeed's credentials for video editing are impressive.

The Emagen Lightspeed DV is covered by a one-year onsite parts and labour warranty and an additional one-year return-to-base warranty applies to parts.

Marvel Tornado 3200 iE

The Tornado 3200 iE is built on an ASUS P4C-800 Deluxe motherboard, 3.2GHz Pentium 4 processor and 1GB of PC3200 RAM. This solid base is further enhanced by dual 200GB Seagate Barracuda 7200.7 Serial ATA hard disks in a RAID array and dual LG optical drives — a 12x Double Layer DVD burner and 16x DVD/CD-RW combo drive.

While some vendors opted not to include a dedicated soundcard, the Tornado is fitted with the Sound Blaster Audigy 2 ZS, which provides clear, crisp sound while shunting audio processing away from the CPU. A 256MB GeCube ATI Radeon X800 video card, a 17in Mitsubishi Diamond View DV175 TFT monitor running at a native resolution of 1,280 x 1,024 pixels and a Hauppauge Nova-T TV tuner card round out the specs.

This combination of hardware enables the system to reach scores of 28.8 in Multimedia Content Creation Winstone 2004, 342 under Cinebench Shading (CINEMA 4D) and 4,892 in PCMark04. While these scores aren't blisteringly quick, they indicate the Tornado to be a capable and stable machine.

The software bundle is meagre — Windows XP Home, InterVideo's WinDVD Suite, CyberLink Power2Go 5 and Nero Express 5.5.9.9. However, the motherboard's integrated 802.11b Wi-Fi access point may be of interest to users with Centrino-class notebooks.

The one-year return-to-base warranty on parts and labour is comparatively poor, and a disappointment considering the price point.

PC Quest In House Director

PC Quest's In House Director is a well-constructed video editing powerhouse. A 3.2GHz Pentium 4 CPU is built on an ASUS P4P800-E Deluxe motherboard and paired with 1GB of PC3200 RAM in two 512MB sticks.

Two hard disks — a Western Digital Raptor 36GB 10,000rpm drive and a WD2000 Western Digital 200GB Caviar drive — are configured as system and data partitions. Both are connected via Serial ATA.

A Creative Audigy 2 ZS soundcard serves for audio input and output. The high signal-to-noise ratio of the card ensures mic recorded voice-over and soundtracks are crystal clear. A 16x Lite-On DVD-ROM and Lite-On 8325 8x DVD writer with Double Layer support are both included.

The GeCube Radeon 9600XT video card plays second fiddle to the Canopus Let's Edit RT+ capture card. The RT+ has a variety of inputs and outputs including FireWire, two S-Video DINs and 3.5mm audio jacks. Combined with the Canopus Let's Edit software, the RT+ card is a powerful tool for video capture and editing. A 19in ViewSonic P95f CRT is also supplied.

Benchmark results of 358 in Cinebench (CINEMA 4D) and 4,929 under PCMark04 are among the best in the roundup. A respectable 33.3 is achieved in Multimedia Content Creation. The PC ran hot during testing, but this can be overcome with the addition of an extra fan.

The In House Director's RTB warranty covers parts for two years and labour for five.

Pioneer Computers Platinum

Pioneer's Platinum comes fitted with a blisteringly fast AMD Athlon 64 3800+ CPU on a Socket 939 ASUS A8V Deluxe motherboard matched to two 512MB sticks of PC3200 memory. A Gigabyte Radeon 9800XT 256MB with S-Video out and a Pioneer DreamVision Digital TV card take care of the machine's video requirements.

Unfortunately, there's no method of accepting a video-in signal; all footage must be transferred via USB or FireWire, reducing the PC's usefulness for those wishing to transfer footage from old VHS tapes or analogue video cameras.

A Creative Sound Blaster Audigy 2 DE soundcard is installed for audio recording and playback — more than adequate for clear soundtracks and recordings. Two Seagate 7200.7

Serial ATA 120GB hard disk drives in RAID 0 are offered, plus a 120GB Parallel ATA Seagate drive. Sony's Double Layer-compatible DRU-700A drive is included for backup and output.

The Mitsubishi DV175 17in LCD monitor is eminently suitable for video editing. Its 16ms response easily displays the 25fps required for smooth PAL video playback.

The Platinum scored 388 in Cinebench CINEMA 4D tests and a respectable PCMark04 score of 4,692. Multimedia Content Creation Winstone clocked the Platinum at 34, showing that the PC is well suited to multimedia tasks.

The Pioneer Platinum comes with a one-year onsite warranty on parts and labour, then two years RTB covering labour only.



Details

Contact	Pioneer Computers
Phone	(02) 9690 2888
Online	www.pioneercomputers.com.au
Price	\$3,999
✓	Powerful system; DL drive.
✗	No video input; 17in monitor.
Verdict	★★★★☆

Plus Corporation Altera A36

The Plus Altera A36 includes an Athlon 64 3500+ CPU on an ASUS A8V motherboard, paired with two 512MB sticks of PC3200 memory. Though not at the top of the list as far as base specs go, the combination works nicely.

Storage is in the form of two 200GB WD2000 Western Digital Serial ATA hard drives. The drives are configured as RAID 0 out of the shop, though this can be changed on delivery. The fast RAID 0 configuration is ideal for scratch work with video files but is twice as likely to incur data losses due to faulty hardware. A Sony DWU-18A10B DVD±RW drive is included for optical media.

Unfortunately, the Altera A36 doesn't include a standalone soundcard, relying on the motherboard for audio capture and playback. This

serious omission cost the Plus a higher score.

The bundled DVICO DVB-T Lite digital TV capture card is great for watching and recording digital broadcasts and also includes inputs for capturing analog video from camcorders, VHS or other sources. A GeCube X800 Pro video card is also supplied, and is suitable for offloading video encoding to the GPU. The 19in BenQ LCD monitor is perfect for working with video timelines.

The Altera A36 scored well in benchmarking. With a Cinebench (CINEMA 4D) result of 380 and a PCMark04 rating of 4,696, the Altera A36 is suitable for intensive video editing tasks. A score of 33 is achieved in Multimedia Content Creation.

The Plus Altera A36 is provided with a one-year onsite warranty.



Details

Contact	Plus Corporation
Phone	1800 007 587
Online	www.pluscorp.com.au
Price	\$3,995
✓	Good video capture/digital TV card; 19in LCD monitor.
✗	Onboard sound only.
Verdict	★★★★☆

All the right moves

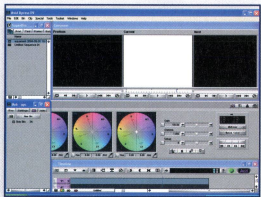
The PC has been purchased, video footage has been shot and the DVD burner is aching to make the film a reality. Now what?

For the beginner, the answer lies in applications or suites such as Pinnacle Studio, Roxio Easy Media Creator, Apple's iLife and Ulead VideoStudio. These enable the basic video editing functions such as cutting, adding transitions, text overlays and soundtracks.

More experienced users will be drawn to apps such as Adobe Premiere and Ulead MediaStudio Pro, and there's even more powerful software on the market

that's still within the budget of most users. Avid Xpress DV and Sony Vegas are two suites designed for professional and prosumer users; the downside is that they require specialist training before good results can be expected.

Once the project is edited, burning to DVD is the next logical step. Most digital video editing suites include DVD authoring components, though they are of varying quality. Some DVD and CD burning applications such as Ahead's Nero and Roxio's Toast offer DVD authoring.



Avid Xpress offers professional results, but the learning curve is steep.

TI Computers AMD Super Power 4000

TI's video editing PC is not a star performer. Built on an AMD Athlon 64 3500+ CPU and ASUS A8V Deluxe motherboard, 1GB of PC3200 RAM and two 200GB Seagate 7200.7 Serial ATA hard drives, the AMD Super Power 4000 lacks CPU power compared to the other entries in this roundup.

The drives are configured in a RAID 0 setting, and while this is not ideal for storing important data, the speed trade-off can be useful in video and audio editing tasks where disk access is heavy and constant.

The machine's best feature is the inclusion of a powerful GeForce 6800 GT-based Leadtek A400 video card. The 256MB card has plenty of power to support apps that can shift image calculations

to the GPU; however a lack of TV input restricts the PC to taking video via USB or FireWire only. An LG 12x 4120BB Double Layer DVD drive takes care of optical writing. An LG 16x DVD-ROM is also included to enable direct disc-to-disc copying. Sadly, the system is limited to onboard sound — a dedicated soundcard is preferred.

A very good 19in Samsung flatscreen monitor is supplied. The extra display space is ideal for manipulating video and still images, and the clear display is easy on the eyes when working for long stretches.

In testing, the Super Power 4000 scores 313 in Cinebench (CINEMA 4D), 31.3 under Multimedia Content Creation 2004 and 4,373 in PCMark04.



Details

Contact	Trinity International Computers
Phone	(02) 9437 5437
Online	www.ticomputers.com.au
Price	\$3,295
✓	High-end video card.
✗	No video capture devices; onboard sound.
Verdict	★★★★☆

Benchmarks

While most of the machines here are strong performers, the Editor's Choice award goes to the Dell Dimension 8400.

In a field where raw power is a key consideration, the Dell blitzed all benchmark tests, notching up the top scores in PCMark04 and Cinebench (CINEMA 4D). Although the Dell's Multimedia Content Creation Winstone 2004 was a little down at 30.7, the combination of 3.6GHz Pentium 4 processor, 1GB of DDR2 memory and 160GB Western Digital hard disk provides a strong base for a fast multimedia machine. The

system achieves solid scores in 3D benchmarking as well, indicating great performance in recently released games.

PC Quest's In House Director also offers solid benchmark scores and a stellar mix of hardware, including a Canopus Let's Edit RT+ capture card, plus a Double Layer burner. As a result, it takes a Highly Recommended award.

As all the systems retail at around the same price, APC thought it unfair to single out any one vendor for a Best Value award in the context of this Labs Challenge.

	PCMark04	Multimedia Content Creation Winstone 2004	3DMark03	Doom 3 Time demo 1 (frames per second)	Cinebench 2003 Shading (CINEMA 4D)	Cinebench 2003 Shading (OpenGL Software Lighting)	Cinebench 2003 Shading (OpenGL Hardware Lighting)
Acer	3,995	24.6	8,341	34	DNF	DNF	DNF
Altech	4,301	31.7	10,053	68.3	356	1,648	2,943
Apple	N/A	N/A	N/A	N/A	251	701	1,020
 Dell	5,559 ★	30.7	10,377	61.6	402 ★	1,506	2,840
Emagen	4,350	31	3,039	26.7	330	1,752	2,046
Marvel	4,892	28.8	9,636	58	342	1,398	2,849
 PC Quest	4,929	DNF	5,683	42.5	358	1,458	2,306
Pioneer	4,692	34 ★	6,917	57.2	388	1,788 ★	3,469
Plus Corporation	4,649	33	10,414	73.7	380	1,787	3,780 ★
Trinity International	4,373	31.3	10,970 ★	84.6 ★	313	1,638	3,299

★ Denotes highest score in category.

You don't expect photo quality.

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CD printing.

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double sided
printing.

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Digital SLR cameras

How we tested

Each camera was tested in a variety of conditions. A range of complex shots was taken, allowing the tester to experiment with depth of field, capturing multiple subjects and high-contrast colours. The sample images were printed using an Epson Stylus Photo R800 for assessment.

Shutter speed and write times were timed by recording and analysing the shutter sound. The cameras were rated based on core functionality, interface, responsiveness, ease of use and image quality.

The histogram tool in Adobe Photoshop CS was used to assess tonal ranges and luminosity.

Matthew Overington and Robert Craft get bitten by the shutter bug.

The starting price for digital SLR cameras has tumbled since they debuted a few years ago. Semi-professional cameras are now available for \$2,000 to \$3,000 and are finding their way into the hands of an increasing number of enthusiasts.

There are a few points to consider when shopping for a digital SLR. A decisive factor for experienced photographers is lens compatibility, as using your existing lenses can save enormous amounts of money.

A digital SLR has to feel like a conventional analog camera for it to be truly useful for most semi-professional photographers. This means fast shutter speeds and responsive auto focus.

The biggest benefit of going digital is the ability to instantly preview your shots. The cameras in this roundup feature onscreen histograms that highlight over-saturated or over-exposed areas of the image, helping photographers to compose their shots.

User preferences for control elements and button layout vary, though the range of available adjustments and clear, intuitive arrangement of menu systems is important for people shooting regularly in a range of environments.

Although experienced photographers insist on having a wide range of controls at their fingertips, many buyers won't want to worry about composing their shots all the time. Family parties and get-togethers usually don't require the delicate composition demanded of wedding photos, for example, so good semi-automatic operation is also a consideration. This enables you to quickly grab the camera and go.

If you're going to take the camera along on your travels, it's essential to know where you can get it fixed ahead of time. Check the warranty length and the terms and conditions to make sure you can get it repaired easily anywhere in the world.

Canon EOS 300D

Canon's EOS 300D is essentially a stripped-back version of its EOS-10D in a plastic body. It boasts a 6.3 megapixel CCD and ships with an 18-55mm lens and 256MB CompactFlash card. The 300D weighs only 575g, making it the lightest of the cameras tested, and measures roughly 15 x 10 x 7cm.

The 300D forgoes the selectable AF and metering modes offered by its big brother, and also misses out on a flash sync port. The 300D is also a little slower, offering a timed shutter lag of just over 0.13 seconds and ISO range from 100 to 1,600.

Like the other cameras in this roundup, the EOS accepts Type I and II CompactFlash cards. It also ships with an 8.1Wh battery, which is adequate for around 240 shots with the autofocus and flash turned on. Unusually, the Canon relies on the flash for an AF assist lamp. This isn't ideal as the exposure is calibrated with the flash, and the flash is fired when taking the shot.

EF and EF-S lenses are supported, making it highly compatible with other Canon systems. The 1.8in LCD panel is bright enough for viewing outdoors. A four-way dial provides access to menu functions, and is extremely easy to use. The camera can be used manually or in a range of modes, including full auto, portrait, landscape, close-up, sports, night portrait and flash off (though this also disables the AF illumination).

It takes about three seconds to start up, but once the 300D is up and running, shooting is extremely quick.

The camera also features a burst mode, where 2.5 images per second can be shot. Image quality is good, showing smooth tones, good colour balance and saturation, and no sign of moiré. Skin tones appear a little washed out when shooting in bright conditions, but this can easily be corrected in Photoshop. Bracketing is supported, so you can always experiment with exposure settings.

The lack of USB 2.0 support for transferring images to the PC is irritating. As with the other cameras, the user is forced to wait when copying images from the camera.



Details

Contact Canon

Phone (02) 9805 2000

Online www.canon.com.au

Price \$2,299

✓ Good image quality.

✗ No AF light; USB 1.1.

Verdict ★★★★★

Nikon D70

Nikon's D70 is a solidly constructed piece of equipment that feels rigid and fits the hand well. It's the largest camera in the roundup, measuring 14 x 11 x 8cm and weighing just over 600g. It offers a 6.1 megapixel resolution and the bundled 10.3W battery is ample for a day's shooting — using automatic focus and the flash for every shot, nearly 300 photos were taken before a recharge was required. No memory card is supplied, but Type I or II CF cards and Microdrives are accepted.

The Nikkor F mount accepts a wide range of Nikon lenses, including regular G or D AF-type SLR lenses. Bracketing is supported, along with a selection of shooting modes, including single frame, three frames per second and a self-timer.

A 1.8in LCD preview screen is included, and there's brightness adjustment for working in a range of light conditions. The large optical viewfinder offers five focus points, and a grid can be overlaid to help line up angled structures and shapes. The camera supports ISO ranges from 200 up to 1,600. The white balance is easy to adjust and can be set to automatic detection, which does a reasonable job.

The bundled 18-70mm lens offers aperture ranges from f/3.5 to f/29. The camera can be

run in fully-automatic mode or a range of scene modes, including night landscape, sports, close-up, landscape and portrait.

It has an AF assist lamp and a hotshoe that supports Nikon flashes natively, but any flash will work with the unit. Slow sync and red-eye reduction are included, with the latter proving very effective when shooting indoors at close range.

One issue that plagues the D70 is slow transfer times. Only USB 1.1 is offered, so moving the contents of a 1GB CF card to your hard disk takes ages. It's highly recommended that you pick up a fast card reader for your desktop, especially if shooting in RAW mode.

The D70's image quality is outstanding, just managing to pip the other two in terms of clarity, sharpness, colour balance and saturation. Some moiré was apparent in shots featuring close detail, but not enough to worry about. Compressed RAW images are handled well. Shutter response time was measured at 0.13 seconds.

Simply put, the Nikon D70 is an outstanding camera at a reasonable price.



Details

Contact	Maxwell
Phone	(02) 8748 5200
Online	www.maxwell.com.au
Price	Body: \$1,999; D70/AF-S with 18-70mm DX lens, \$2,299
✓	Great manual and auto control; outstanding image quality.
✗	USB 1.1
Verdict	★★★★★

Pentax *ist D

At 590g, the 6.1 megapixel Pentax *ist D feels lighter in the hand than the Nikon D70 and is smaller than the Canon EOS 300D at 13 x 10 x 6cm. It supports ISO ranges from 200 to 1,600 natively, and the shutter speed is adjustable from one 4,000th of a second to 30 seconds. The *ist D supports CompactFlash Type I and II and offers +/-3.0 EV exposure compensation in 0.5EV steps.

Existing Pentax SLR owners will be pleased to see the KAF mount, enabling users to attach an enormous range of lenses. The camera is compatible with the company's range of KAF, KAFZ and KA lenses natively, substantially reducing the initial cost for established Pentax customers.

The burst mode handles around 2.5fps, on par with the Canon EOS 300D. The 1.8in TFT is clear and bright and the onscreen menu is easily navigated with the four-way control.

A pair of 1,600mAh rechargeable batteries are included and they proved sufficient for 280 shots with both the flash and autofocus turned on. The camera also accepts four regular AA batteries and an AC adaptor.

In operation, the *ist D is a pleasure to use. Shutter lag time was measured at 0.16 seconds. An autofocus button is positioned on the rear

of the camera, which helps compose shots without the danger of accidentally photographing something prematurely. Both manual and automatic operation is offered.

Images appear softly focused but saturation, colour and exposure are outstanding. Auto white balance adjustment is also a little off, but this can be overcome with manual configuration. Images show few signs of noise and no visible moiré.

As with the other cameras in the roundup, the *ist D only features a USB 1.1 slot, which is inadequate for transferring large images to a PC. RAW images cannot be compressed.

Like the Canon, the *ist D relies on the flash for AF assistance, but bracketing is supported. The hotshoe works with Pentax flashes only.

The *ist D is available in three configurations, starting with body only. The Standard Kit adds an 18-50mm lens and an external flash unit with a guide of 50, while the Sigma Twin Kit offers the camera body, 18-50mm and 55-200mm lenses and a 256MB CF memory card.



Details

Contact	CR Kennedy
Phone	(03) 9823 1555
Online	www.crkenedy.com.au
Price	Body only, \$2,300; Sigma Twin Kit, \$2,799; Standard Kit, \$2,799
✓	Great images; accepts AA batteries.
✗	No AF light; USB 1.1
Verdict	★★★★★

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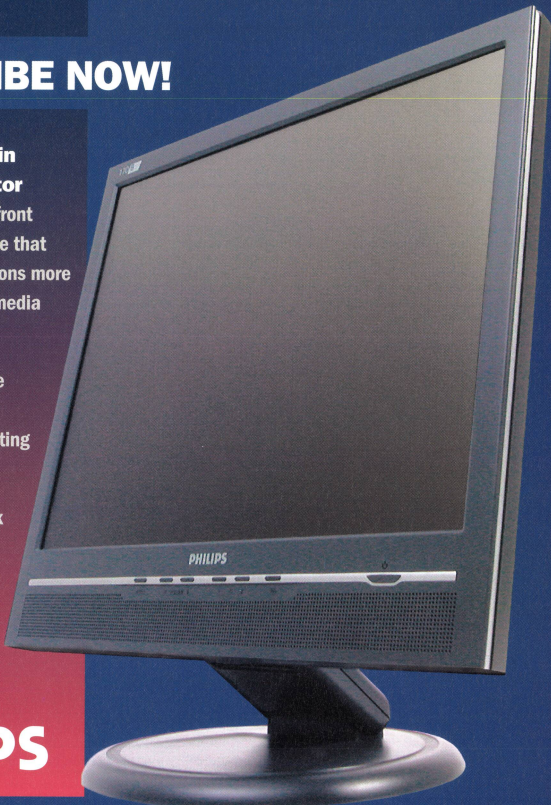
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Laser printers

How we tested

All printers were connected via USB to a Toshiba P20 desknote with an Intel Pentium 4 3.2GHz processor and 1GB of RAM. A 20-page PDF document with text, images and tables was printed at the highest quality supported and timed. Next, a 20-page Microsoft Word document including a logo, text and charts was printed at 600dpi. Then a monochrome television test pattern was printed at full A4 size. The test pattern gives an excellent indication of the printer's performance rating tone/saturation, greyscales/contrast and clarity. All tests were performed with a standard grade 80GSM bond paper. Humidity in the APC Labs remained at a constant level of between 20-30%. The printers were rated on print speed, clarity, contrast, saturation and features.

Once largely confined to businesses, laser printers are now well within reach of the home office. **Nick Race** rounds up eight market leaders.

Undoubtedly, laser printers offer quality and speed advantages over ink and wax-based printers. Though colour models can be pricey, both in initial outlay and replacement toner costs, monochrome laser printers offer the best value for money for high throughput printing.

With the price of smaller laser printers and consumables continuing to fall, more small businesses and home offices are switching to laser to gain the benefits of cheaper per page costs and higher quality text output.

Ink-based printers have the advantage of outputting better looking images, thanks to ink's ability to "bleed" through paper slightly before it dries, smoothing rough lines and edges. However, the speed and clarity offered by laser printing is compelling.

APC Labs pulled out the stopwatch for a showdown of some of the more popular units on the market for small or home offices. All printers in this Labs Challenge offer USB connectivity, and all but one feature a parallel connector for compatibility with older PCs and print servers. Five can be networked, either via an Ethernet connection or through an internal interface.

Overall, the quality of the devices on test was good, with only one unit demonstrating

unimpressive images. Scales of grey are smoother and denser on the 1,200dpi models, while the 600dpi units tend to have lighter tones and show printing artefacts. There were significant differences in saturation and contrast in the test pattern between the units tested, with a higher score going to printers with clearer grey delineation, solid blacks and dark greys. All are more than adequate for text, graphs and tables.

At first glance, toner prices for laser printers seem expensive. However, compared with the running costs of inkjet printers, the price per page for lasers is much lower. Though a toner replacement may cost over \$100, cartridges can typically be expected to output thousands of pages. All toner page counts are measured with 5% page coverage.

When choosing a laser printer, be sure that it will work in your environment. Printers that use the Windows GDI (see "GDI explained", page 67) can be faster and less expensive than models which perform their own rasterising onboard. However, driver support for Linux and Mac can be an issue. If compatibility is a high priority, choose a printer with full PostScript and PCL support. It will cost extra, but will work with a range of operating systems.



Details

Contact Brother

Phone (02) 9887 4344

Online www.brother.com.au

Price \$649

✓ Crystal clear text output; solid blacks.

✗ Slower CPU; poor contrast.

Verdict ★★★★★

Brother HL-5150D

Brother is well known for its range of laser printers and MFCs. The HL-5150D is one of two units in this Labs Challenge to feature duplexing — the ability to print on both sides of the page in one print run. This handy function is an affordable and easy way to print brochures and booklets.

The HL-5150D outputs good quality prints, but isn't the best performer in the roundup. Slight banding is evident in medium greys in the test pattern, though not enough to significantly lower the quality of an image.

Three shades of grey are evident before solid black — clearer printing can be seen elsewhere. All blacks are solid and no blockiness or banding is visible in darker greys. Text output is crystal clear — ideal for standard office documents.

In speed tests, the HL-5150D is outclassed. The PDF test document printed in one minute and 44 seconds — the second slowest in the roundup. This poor result can be attributed to its 133MHz processor, compared to 200MHz in the majority of others in this roundup. The test Word document printed in one minute and 22 seconds.

Windows, Mac OS and Linux are supported, with a full complement of drivers for each OS.

Running costs are low at under three cents per page including toner and drum usage. It offers full PCL 6 support, and a version of PostScript called BR-Script 3 that keeps font information consistent. The HL-5150D is covered by a one-year warranty.

Canon Laser Shot LBP 3200

Canon's Laser Shot LBP 3200 is about as minimalist as you can get. It relies on the Windows GDI for rasterising documents for printing and, since it lacks an internal processor, the speed ultimately depends on the PC it's connected to. A minimal 2MB of RAM is onboard for buffering jobs.

The LBP 3200's output is the clearest of all printers on test, with clearly definable shades of grey are solid with no sign of banding. Blacks are heavy, without speckling or dithering. Text output is also very clear, with definite lines and no artefacts.

This is the advantage of relying on the Windows GDI, as the system is more easily updated (and licensed) for newer printers, though it means non-Microsoft OSes aren't supported.

The LBP 3200 is well-suited to a small office environment, though sharing the printer with more than five users may slow down the host PC.

The Canon LBP 3200 was one of the faster printers on test, printing the PDF document in one minute and 16 seconds. The Word document was produced in one minute and 25 seconds — again one of the best scores in the roundup.

Running costs are around four cents per page, an average cost for a laser printer not designed for high throughput.

The only significant complaint with the Canon LBP 3200 is that its construction seems flimsy. An internal network adaptor is available to connect the printer directly to the network. A one-year onsite warranty is offered.



Details

Contact	Canon
Phone	(02) 9805 2000
Online	www.canon.com.au
Price	\$349
✓	Best quality images: crystal clear text; fast.
✗	Only works with Windows; flimsy.
Verdict	★★★★★

Dell 1700n

The print quality of the Dell 1700n is disappointing compared to the rest of the crowd.

It sports a 200MHz processor and a generous 32MB of memory, ensuring fast printouts. The 20 page PDF printed in one minute and 16 seconds — the second fastest result — and the Word document was output in one minute and six seconds. PCL6 and PostScript 3 support also help speed up output.

Common fonts are stored directly on the printer, reducing the amount of processing it needs to perform. Drivers are available for Windows and Linux users, but not Mac OS.

Though undeniably the fastest printer in the roundup, the image quality is poor. The test pattern showed significant banding and

inconsistent coverage over solid colour areas and only two squares of the contrast gradient and fuzzy white text in grey zones.

The toner cartridge was agitated and the tests repeated (in case toner settling during shipping had affected the output), however, results were almost identical.

Output from the Word document showed good quality results with text. But with PCL6 and PostScript 3 support, nothing less is expected.

The 1700n costs just over three cents per page, including toner and drum usage, to run. A one-year, next business day exchange warranty covers the printer.

If your print jobs are limited to pure text and table output, the Dell 1700n is a suitable device.



Details

Contact	Dell
Phone	1300 303 107
Online	www.dell.com.au
Price	\$419
✓	Fast.
✗	Poor image output; poor contrast; no Mac OS driver.
Verdict	★★★☆☆

GDI explained

Microsoft Windows' method of creating and displaying information on a monitor is known as Graphical Device Interface (GDI). Suitably engineered printers can take advantage of the Windows GDI and print exactly what's visible on the screen.

How this works is that the printer's driver is requested to print a certain document, which then asks Windows to "fake" the document as if it were being displayed on the monitor. The driver takes this faked output, rasterises it into a format the printer can output, then sends it to print.

GDI-based printers don't need to process their own rasterised images,

as the much faster desktop computer does it more effectively. The output on the printer is typically very accurate to the original document, as the document doesn't need to be interpreted with language such as PCL or PostScript, maintaining the original look of the document.

On the downside, GDI printers tend to be made for Windows only. However, new models such as the Epson EPL-6200L are designed to work with the Mac OS X GDI.



MSDN offers all you need to know about Windows GDI.

More information on the Windows Graphical Device Interface is available at http://msdn.microsoft.com/library/en-us/gdi/wingdistart_9ezp.asp.



Details

Contact Epson

Phone 1300 361 054

Online www.epson.com.au

Price \$418

✓ Clear printouts; fast.

✗ No Linux or network support.

Verdict ★★★★★

Epson EPL-6200L

Epson's EPL-6200L should suit most home or small business users. Like the Canon LBP 3200, this printer is host-based, using the PC for data processing. Mac OS is supported for the host, and drivers for both Windows and Mac OS are supplied. Computation is performed via the Mac or Windows GDI. A minimal 2MB of RAM is provided for buffering.

Unfortunately there is no Linux support, and the EPL-6200L can't be fitted with a network adaptor. However, a print server can be used for network sharing.

Four scaled blocks of grey are visible in the test pattern, indicating high quality output with complex material. Some slight banding is evident in solid grey areas and solid black prints

show a little speckling, but this is only really noticeable on close scrutiny.

Output was fast, printing the test PDF file in one minute and 12 seconds; the quickest in this category. Word document output was slower, at one minute and 30 seconds.

Running costs are around seven cents per page including toner and drum usage, making it one of the more expensive machines to maintain in this Labs Challenge. A one-year return to base warranty is offered — about standard for the devices in the roundup.

Overall, the Epson EPL-6200L is a good little printer which should suit most small businesses. However, lack of Linux support and network options limit its potential.



Details

Contact Fuji Xerox

Phone (02) 9690 2888

Online www.fujixerox.com.au

Price \$594

✓ High quality, clear printouts.

✗ No Mac or network support; shallow paper tray.

Verdict ★★★★★

Fuji Xerox Phaser 3130

Fuji Xerox's Phaser 3130 produces top quality prints. It uses a last-generation 166MHz processor, but the generous 32MB memory buffer helps speed through the printing process.

The Phaser is let down by the limit imposed on paper weight in the main tray — it only supports up to 90GSM, equivalent to good quality business paper. The print output tray is very shallow, and during testing, pages fell off the tray after around 30 sheets were collected.

Monochrome test pattern results were excellent, clearly defining greys up to four levels. Solid blacks showed no sign of patchiness or streaking, however grey levels displayed some banding.

Text output is perfect, and tables and graphs are easily read with no signs of print artefacts. The Phaser printed the PDF document in one minute and 33 seconds. The test Word document printed in one minute and 46 seconds.

There is no network support, either internally or as an added option. However, it can be connected to a USB or parallel print server. PCL support is available. Only Windows and Linux drivers are offered.

The Phaser 3130 costs around five cents per page to run, including toner and drum use. However, note that toner pricing is based on an unrealistic 5% page coverage. A one-year "like-for-like" replacement warranty is offered.



Details

Contact Hewlett Packard

Phone 13 23 47

Online www.hp.com.au

Price \$429

✓ Excellent contrast.

✗ Unimpressive print times; no Linux or network support.

Verdict ★★★★★

HP LaserJet 1015

The LaserJet 1015 from HP is a very small and basic personal laser printer. Rated at 14 pages per minute, the 1015 is at the lower end of the speed scale of the printers in this Labs Challenge, with a lower price tag to match. It sports a 133MHz processor and 16MB of RAM, explaining the relatively long time it takes to generate printouts.

Print quality is excellent, however. Output is quite dark overall, but clear contrast is maintained. Four shades on the greyscale are clearly defined. Solid grey areas show some slight banding.

Text output is very clear. The test PDF printed in one minute and 29 seconds; the Word document was completed in one minute and 46 seconds — times that can be regarded as average.

No network adaptor is supplied, nor does the machine have the capability to add an internal adaptor. However, an external print server can be used. Drivers for Windows and Mac OS are included, though the 1015 does not have driver support for Linux — only PCL is supported.

This printer has the lowest power consumption of all the units tested: while printing the LaserJet uses a maximum of only 214W.

The 1015 costs approximately six cents per page to run, including toner and drum usage. This is a little on the high side, but is still acceptable for a low throughput printer. A one-year warranty is provided.

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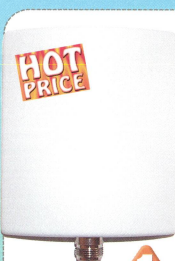
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Cat 9180-1 \$239



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Cat 9229-1 \$69



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Cat 11430-1 \$139

"It's transfer speeds were almost uniformly excellent and remarkably consistent"

PC User magazine
August 2004



Luminescent Keyboard

This 105 key keyboard has a remarkably soft, even, luminescent back light.
Cat 1008171-1 \$79



Extend USB 50m

Use any USB device up to 50m from a PC over inexpensive UTP cable (not included)
Cat 11666-1 \$105



USB Net Phone

Make free PC to PC calls, and calls to landline phones world-wide at ridiculously low rates over your internet connection.
Cat 10129-1 \$89



Front Access Bay

This 5 1/4" bay has USB 2.0, FireWire, Power Out, Audio In/Out and a 6 in 1 memory card reader.
Cat 6765-1 \$129



Two Port KVM with Sound

Allows one keyboard, monitor, and mouse to control two PCs. Includes 1.2m cables.
Cat 11669-1 \$139



SATA HD Rack

This removable HD kit includes the tray and frame and is aluminium.
Cat 6787-1 \$139



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Watch TV on your laptop or PC.
Cat 3527-1 \$189



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This tiny LCD screen is great for space critical situations.
Cat 4658-1 \$969



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Attach up to four IDE drives in RAID
Cat 2386-1 \$99



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This great capture card comes with a front access bay for easy access. Captures analogue and digital signals.
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LABS CHALLENGE



Details

Contact Kyocera Mita

Phone (02) 9888 9999

Online www.kyoceramita.com.au

Price \$659

✓ Good image quality; low running cost.

✗ Unimpressive print times; no Linux support.

Verdict ★★★★★

Kyocera Mita FS-1010

Kyocera Mita's FS-1010 took a little fiddling to get up and running. A number of print drivers are pre-installed (not uncommon for an office environment with multiple printers), but the Kyocera could only print the first few pages of the test Word document before flagging a PCL error. Once extraneous drivers were removed and re-installed, operation was smooth.

The FS-1010 is marketed as an environmentally friendly device, thanks to an extremely long long life internal drum kit which is good for 100,000 pages. It also sports a PowerPC 200MHz processor and 16MB of RAM which is upgradeable to a whopping 144MB.

Print quality on the test pattern was good, showing contrast in four levels of grey. Some

streaking is evident in dark greys and black, and banding was noticeable in darker greys, but the quality is acceptable. Text output is clear and PCL is supported.

Output speeds are disappointing. The PDF printed in one minute and 36 seconds — an average result for this roundup. The test Word document took one minute and 56 seconds to complete the printout. Only the Samsung took longer to complete this test.

An optional network card is available. Windows and Mac OS are supported, but Linux users are left out in the cold.

The FS-1010 costs just under three cents per page to run including drum and toner use. A three-year RTB/100,000 page warranty is offered.



Details

Contact Samsung

Phone 1300 369 600

Online www.samsung.com.au

Price \$499

✓ Clear text; good warranty.

✗ Poor image quality; slow.

Verdict ★★★★★

Samsung ML-2550

Samsung's ML-2550 fails to impress. Image quality is poor, it has a tendency not to fix the toner properly, and the produced the slowest printing time in the roundup.

The ML-2550 looks great, but the quality of its output doesn't match the external build. The test pattern was clearly banded through the majority of the page. Images from the PDF document had white lines through darker areas; an unacceptable result. Greys were delineated to three shades — only the Dell fared worse.

Running costs amount to around three cents per page for toner and drum use — especially good considering a toner cartridge lasts for 10,000 pages.

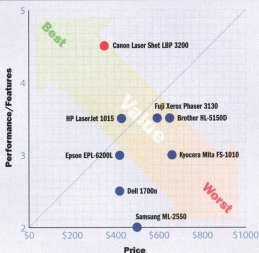
This printer is very slow compared to the

competition, despite having a 266MHz processor and a 32MB memory bank. It also paused noticeably between pages. Two complete paper jams were experienced during testing.

Timing results were the slowest of the bunch. The test PDF document took two minutes and 42 seconds to print the 20 pages. The Word document took two minutes and two seconds to complete. Considering the Samsung's superior processor, PCL and PostScript support, these results are abysmal. Drivers are available for Windows, Mac OS and Linux.

Samsung offers a three-year onsite warranty with the ML-2550, the best warranty terms in this Labs Challenge. An Ethernet-enabled version, the ML-2551N is available for \$1,295.

apc price-to-performance ratio



Picking a winner for this laser printer roundup was difficult. The generally high quality of the printers' text output made a comparison on that basis extraneous. However, the quality and clarity of the greyscales and solid areas in the test pattern printout showed a wide variation.

The Canon Laser Shot LBP 3200 took out the Editor's Choice award on the strength of its ability to accurately reproduce the test pattern. The speed of the LBP 3200 was also a major factor. The Canon's output was always in the scale of quick and good, rather than quick and dirty. The only caveat is its reliance on the GDI, meaning this machine will only work under Windows. Those looking for specific Linux support can't go past the Brother HL-5150D.

The Canon Laser Shot LBP 3200 also takes out our best value award, though HP and Epson deserve credit for producing quality product at a reasonable price.



b&w laser printers

Manufacturer and model	Canon Laser Shot LBP 3200	Epson EPL-6200L	Dell 1700n	HP LaserJet 1015	Fuji Xerox Phaser 3130	Brother HL-S1500	Kyocera Mita FS-1010	Samsung ML-2550
Price	\$349	\$418	\$419	\$429	\$594	\$649	\$659	\$499
Rated speed (ppm)	18	20	25	14	16	20	14	24
Maximum resolution (dpi)	600	600	1,200	600	600	1,200	600	1,200
CPU speed	Host-based	Host-based	200MHz	133MHz	166MHz	133MHz	200MHz	266MHz
Standard/maximum memory (MB)	2MB	2MB	32MB/160MB	16MB/16MB	32MB	16MB/144MB	16MB/144MB	32MB/160MB
PCL	No (CAPT)	Host Based	PCL6	PCL5e	PCL6	PCL6	PCL6	PCL6
PostScript printing (Level)	CAPT	NA (required memory upgrade)	3	NA	NA	BR-Script 3	PostScript 2	PostScript 3
Network option/price	Yes/\$399	No	Included	No	No	Yes/\$299	Yes/\$493.90	No
Paper sizes	A4, B5, A5, Legal, Letter, Envelope	A4, A5, B5, Legal, Letter, Half-Letter, Executive, Government Legal, Government Letter, F4, International B5	Letter, Legal, Executive, Folio, JIS-B5, A4, A5, Statement, Universal	A4, A5, letter, legal, executive, B5 (US), B5 (ISO), C5, DL, Monarch, Com 10	A4, Letter, B4, A5, B6, A6, Executive, Legal	A4, Letter, B4, A5, B6, A6, Executive, Legal	A4, Letter, B4, A5, B6, A6, Executive, Legal	A4, Letter, B4, A5, B6, A6, Executive, Legal
Paper input (number of sheets)	250	150	250	150	250	250	300	600
Paper output (number of sheets)	100	100	150	100	50	150	150	250
Maximum paper weight	90GSM	163GSM	163GSM	105GSM	90GSM	161GSM	105GSM	163GSM
Monthly maximum duty cycle	Not Stated	15,000	15,000	7,000	15,000	20,000	8,000	15,000
Windows driver	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Linux driver	No	No	Yes	No	Yes	Yes	No	Yes
Mac driver	No	Yes	No	Yes	No	Yes	Yes	Yes
Toner life (max number pages at 5% page coverage)	2,500	3,000	3,000	2,000	3,000	6,700	6,000	10,000
Replacement toner cost	\$119	\$181.50	\$104.50	\$124.95	\$154	\$112	\$163.90	\$275
Replacement drum cost	NA	\$154	NA	NA	NA	\$202	NA	NA
Watermarks	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Multiple pages per sheet	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Scaling/zoom	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interfaces (parallel, USB, network)	USB	Parallel, USB	Parallel, USB, Ethernet	Parallel, USB	Parallel, USB	Parallel, USB	Parallel, USB	Parallel, USB, Ethernet
Dimensions (w x d x h, cm)	38 x 39.6 x 24.5	38.5 x 27.9 x 26.1	39.4 x 35.3 x 24.9	37 x 23 x 20.8	35.2 x 37.2 x 19.6	38.2 x 40.1 x 25.2	37.7 x 37.5 x 22.2	38.6 x 43.6 x 32.6
Weight (kg)	6	6.9	12.2	5.9	7	11.9	9.5	13.5
Peak power consumption (W)	750	825	600	214	280	460	265	450
Idle power consumption (W)	7	8	20	7	10	5	5	20



System monitoring utilities

How we tested

An Acer Veriton 3600G with a 3GHz Pentium 4 CPU, 1GB PC2700 RAM and a 120GB Seagate hard disk was used as the testing platform. The Acer-branded motherboard is based on the Intel 865G chipset, with Phoenix AwardBIOS CMOS and an LM78 hardware sensor. It supports PC Health Status monitoring and SMART compatibility was enabled during testing.

Windows XP Service Pack 1 was installed, then each of the utilities was run in turn. We assessed how they dealt with detecting the hardware, what kind of information they produced, how useful the information was, how customisable the meters were, and whether settings could be tweaked from within Windows.

The intention was to obtain information relevant to the performance enthusiast and therefore focused on temperatures, speeds and voltages as a core requirement.

From your computer's perspective, the world is a complex system of circuits and processes. **James Bannan** looks at a variety of packages that let you keep an eye on what's going on.

Tweaking a computer goes much further than Windows settings and registry hacks. Serious performance boosts can be gained from altering some of the core system settings — voltage, clock cycles and fan speeds to name a few. But when you make these kinds of modifications, how can you tell if they're doing what you expect? More importantly, how can you tell if your computer can't take the strain?

Monitoring software is designed to assist power users tweak their hardware by plugging in to the BIOS and monitoring functions. Plug and play operating systems such as Windows still allow this direct access as it enhances OS compatibility, allowing the system to recognise integrated peripherals and system architecture, which gives more accurate driver matching and system stability.

System monitoring utilities go one step further. They read the electrical information that Windows generally ignores, such as the temperature inside and outside the box, core voltages, fan speeds and hard disk information. They get this information from hardware monitors positioned on the motherboard. Different motherboards have different sensors, so the information available varies from system

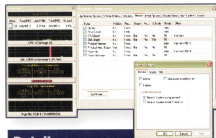
to system. This data is then read in real time and displayed on the Windows desktop.

Why bother with these applications? If you're serious about tweaking your computer's hardware or troubleshooting any problems, you need to know what's going on at the motherboard level.

For instance, you might have issues with system instability. This could be caused by a hot CPU, faulty RAM, or any number of other factors. With a system monitor, you can keep an eye on system temperatures and determine when the CPU fan is running at its peak. A monitoring utility is a great tool for overclocking as it enables you to stress a machine until it keels over, then wind back the settings to a stable configuration.

The BIOS should give you all of this information anyway, but without a monitoring tool you'll be stuck there. These tools enable you to run your machine as usual, keeping an eye on system vital signs, just in case anything goes wrong.

Even though overclocking isn't usually done on a daily basis, monitoring software can also act as an early warning system by flagging any crucial hardware component that is failing. This gives you adequate time to turn the machine off and prevent serious damage.



Details

Contact	Tiler
Online	www.tiler.com/freemeter
Price	Free; Professional, US\$27
	Straightforward; easy-to-read output.
	Limited functionality.
Verdict	★★★★★

Freemeter 2.8



Freemeter 2.8 is available in two versions — a full-featured commercial application or a freeware package. However, the free version comes with a limited set of meters and capabilities, and some features are only available in the US\$27 Professional build.

When active, Freemeter displays a control panel showing the output from the selected meters. The physical memory, paging file and CPU outputs are useful from the perspective of software tweaking, and there's even a feature to monitor incoming emails. However, only the Disk Graph showing average read/writes per second to the hard drive is relevant for hardware tweaking.

Customising Freemeter is easy, mainly because there's not much you can do with it other than alter the way each meter monitors the hardware, and how the meter displays its output. The meters also output to the system tray, so you can keep the control panel hidden during normal operation.

The Professional version monitors page faults, file caching, can output to an external LCD, and has ping and CPU alerting. It also supports alerts for all meters, which seems a glaring omission from the free version, where only the disk space meter has an alert option.

The level of support is reasonably good, with Web-based FAQ, contact forms and a ProCentre for Professional licence holders.

Hardware Sensors Monitor 4.1.4.4



This shareware utility only looks at hardware statistics, plugging straight into the sensor chip to do so. It can monitor up to four temperature components, four system fans and four voltage areas. The actual number of monitors depends on the capabilities of the sensor chip.

The display is a simple table reporting the detected values, and hovering over the system tray icon with the mouse pointer brings up a small info balloon. You can change the icon to output any of the other sensors. Each sensor is customisable, allowing you to tweak the measurements if they differ from what the sensors are reporting in the BIOS.

Considering that you have to reboot and get into the BIOS to check, this is annoying. The

software can also log data and events (such as alerts) into a CSV file, which is useful if you need to go back and check performance history as you can graph it over time using Excel.

Advanced features like SMART monitoring, CPU throttling and remote monitoring are only accessible in the Professional version, which costs US\$29 but works well.

Hardware Sensors Monitor couldn't properly detect the test hardware. Although disappointing, the product's author encourages users to contact him directly with unsupported systems so they can be added to future releases. Hardware Sensors Monitor 4.1.4.4 is a great application, provided you've got a reasonably popular motherboard.



Details

Contact	Hardware Monitor
Online	www.hmonitor.net
Price	Shareware (one month); Standard, US\$24; Professional, US\$29
✓	Good monitoring functionality and interface.
✗	Limited hardware support.
Verdict	★★★★☆

Motherboard Monitor 5.3.7



Motherboard Monitor (also known as MBM) is one of the most popular hardware monitoring utilities around.

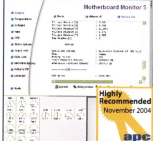
On launch, Motherboard Monitor runs through a configuration tool prompting the user to select the appropriate motherboard manufacturer and model — unlike most other utilities, it doesn't do this automatically. The test machine's motherboard wasn't in the supported list, but the System Info allows for some manual configuration.

Although the fan sensors were detected, they're not available as selectable options, so the CPU fan speed couldn't be metered. The CPU temperature meter registered -128°C — hardly an accurate reading.

The visual display is pretty basic but easy to understand and use. A simple table displays all the utility's meter readouts in speedo-style measurements. You can add or remove meters as desired.

MBM can't modify any hardware settings from within Windows — it just monitors activity, displays the readouts and will alert you to particular values if requested.

Unfortunately, technical support for Motherboard Monitor has dried up from the author, who is no longer developing the application. There is, however, a huge and bustling community of MBM enthusiasts, and third party development and support for the program is continuing.



Details

Contact	Motherboard Monitor
Online	http://mbm.livewiredev.com
Price	Free
✓	Clear output; enthusiast support and development.
✗	Not always accurate.
Verdict	★★★★☆

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Details

Contact Samurize

Online www.samurize.com

Price Free

✓ Customisable.

✗ Requires work to get up and running.

Verdict ★★★★★

Serious Samurize 1.55

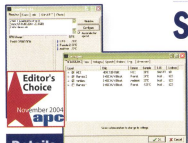


Serious Samurize is a freeware hybrid between a hardcore monitoring application and a graphic art package, and has hosting support from Stardock, makers of skinning applications for Windows. Installation is straightforward, but the app doesn't automatically sense or configure any hardware — if you want something monitored, you have to create the meter yourself using the Config Tool.

The vast majority of meters available in Samurize are geared towards hardware/software interaction, like processor utilisation, paging file, memory usage and so on. There are some meters, like PhysicalDisk and Memory, which are more relevant to low-level hardware monitoring, but that's about it. However, Samurize has a massive online community of artists, modders

and tweekers who create plug-ins and scripts for custom meters, and there are a few which relate to hardware aspects like CPU temperature and SMART monitoring. There are also plug-ins to read information from meters from other apps, such as MBM and SpeedFan, so the potential is limitless.

Samurize is easy to use but difficult to master (see the Workshop on page 110). Each aspect of the program is customisable, and how it displays depends on personal taste — everything from a plain text display to an artistic extravaganza is possible. The online community has fantastic resources, however, and we were able to find enough scripts and plug-ins from the support forums to allow us to extend monitoring to all the important aspects of the test system.



Details

Contact SpeedFan

Online www.alimco.com/speedfan.php

Price Free

✓ Great monitoring for most components.

✗ CPU temperature inaccurate.

Verdict ★★★★★

SpeedFan 4.15



This freeware application plugs straight into the hardware sensors, providing readouts on temperature, voltage, fan speeds and SMART status.

In testing, SpeedFan was the only application to accurately detect the hardware platform upon installation, though it still struggled to precisely monitor the CPU temperature.

The power of this application lies in its ability to alter hardware settings within Windows. It's possible to directly decrease the fan speed and watch the ambient and hard disk temperatures rise accordingly. You can also modulate the motherboard clock speed, bus speed and RAM clock, as well as the chipset clocks.

These settings are quite advanced, and you can set servo limits that tell the application what to adjust the CPU clock to if it drops below a certain level. In addition, it's possible to set alert temperatures for the different meters and log individual monitors. SpeedFan also reads the full swathe of SMART information from the hard disks.

Support for SpeedFan is comprehensive. The Web site lists the full range of compatible hardware and the program's writer encourages users to contact him directly with any concerns. There is also a bug tracking Web site where you can monitor the progress of reported issues. SpeedFan is completely free, and there is no Professional-style upgrade necessary.

apc The verdict

Of all the utilities tested, SpeedFan 4.15 was the only app which gave a good indication of what was happening, offering on-the-fly manipulation of values as real time readouts of those changes and their effects on the hardware. The warning system — visual, audible or email-based — is assurance that you'll be informed when something is awry, and the tools to fix the problem are immediately at hand.

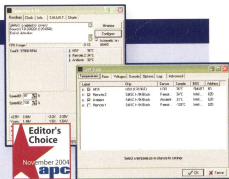
This is the kind of functionality that serious tweekers need. You don't want to make modifications within the BIOS, reboot to see the results, only to have to reboot again to tweak something else. You want to be able

to make changes as required, interacting with your core system as easily as you would with the registry or Explorer.

SpeedFan stands apart from the other utilities in that it's not motherboard-dependent. All it cares about is the type and capabilities of the hardware sensors, which is why it's the best at adapting to the test platform.

Technical support for the application is good, and is updated by the writer regularly. There's no active forum, but the writer is easily contactable via email for any really tricky problems.

A SpeedFan plug-in is available for



Samurize. Considering the fantastic range of monitoring utilities available which specifically look after system performance, running the two applications in tandem for complementary, all-encompassing system monitoring is recommended.

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DIGITAL music

Find, manage and mix it

Turn your PC into the ultimate home audio setup with APC's expert guide to the best players, online music sources and ways to manage and mix your tracks.

Got a seriously *big* music collection? If you have more than 1GB of music on your PC, finding, sorting and even playing your tracks can become a headache. Which software supports which formats? How do you tag and sort songs? What about editing and mixing music?

While almost everyone plays music on their PC, we know APC readers want to go further. So we've put together this guide to setting up the ultimate music hub. Here you'll find everything from the best legal music download sites to software for playing, mixing and even editing your sound files.

Fortunately, online music needn't mean viruses and lawsuits. The biggest news since our last look at online music has been the launch of local legal online music services, including ninemsn Music, BigPond Music and Destra Music Services. They won't replace the CD shop anytime soon, but from as little as 99 cents per track, the future looks promising.

On our cover CD you'll also find a voucher for a free music download at Harvey Norman's new online store, as well as 51 free music tracks from a selection

of up and coming talent. For those into editing and mixing music, we've included some free loops and samples supplied exclusively for APC readers by Groove Terminator and Pocket. Turn to page 98 for more information about how your mixing skills can win you prizes.

We've also taken a cold, hard look at the cult of Apple's iPod and iTunes. Sure, it's still one of the best hardware/software combos out there, but there's no shortage of solid alternatives. We call them the iPod killers, led in the hardware category by Creative's Zen Touch 20GB hard disk MP3 player, which gets APC's Editor's Choice award this month.

Even your LPs and cassettes get a digital makeover — once you've got the songs on your hard disk, take a look at our tutorial on cleaning up digital audio with Steinberg Clean. If you're wondering whether your PC can handle all this, then turn to page 94 for a guide to what's new in soundcard technology. It explains what you need to transform your PC audio for the ultimate games system, editing station, home theatre system or all three.

What's inside

78 Download services

BigPond Music, Destra Music and ninemsn Music are put to the test.

80 Software players

Reviews of 11 players for Windows, Linux and Mac.

82 Steinberg Clean

Strip unwanted noise from digital music files with Steinberg Clean.

84 Hard disk players

Nine players tested.

94 Soundcards

Three cards for all budgets.

96 ACID and Audition

Mix your own tracks.

98 Competition

Win a Creative Nomad Zen, \$100 worth of downloads and more!

Keeping it legal

Don't waste time and effort on peer-to-peer services like Kazaa when you can buy music legally online, writes **Andrew Parsons**.

When people talk about downloading music they're usually discussing some sort of illegal, or at best quasi-legal, method of obtaining digital audio. With the proliferation of peer-to-peer (P2P) services available, finding and downloading your favourite bands and music genres in ways that circumvent legal issues is as easy as clicking "connect".

But P2P isn't all it's cracked up to be. At first, the only problems users of P2P networks such as eMusic and Kazaa had to deal with were the occasional corrupt file or two, but networks are increasingly clogged with bad files and even clips with embedded viruses.

There is an alternative: logging onto legal online music stores that provide high-quality audio protected with a variety of digital rights management (DRM) techniques to restrict

copying. You could use one of the international music sites, but what kind of customer service are you going to get? What happens if something goes wrong? How much are you really paying when you consider the exchange rate?

Fortunately, a wide range of local, legal online music shops are now up and running. At the time of writing, these include ninemsn Music, Telstra's BigPond Music and several online sources with music provided by an outfit called Dextra.

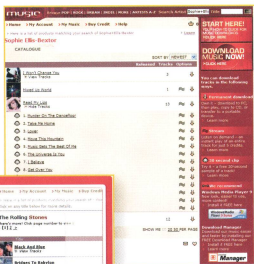
For iPod owners, the big question is when Apple's iTunes will open for business in Australia. While iTunes offers music downloads in the AAC proprietary format designed to work with the iPod, the other sites discussed here use Windows Media Audio (WMA) files, particularly WMA9, to restrict copying.

NINEMSN MUSIC

Of the three services reviewed, ninemsn was the most successful in finding music matching the search criteria and was the only site to locate tracks by Midnight Oil.

Search results are presented in an easily managed interface, with the option to search either by artist name or by album title, with expandable track listings for each. The results can also be sorted by date or title.

Ninemsn is the only one of the three Australian services to feature a download manager to facilitate the transmission of your music files, but it's perhaps the one that needs it the most. This is due to some issues in re-downloading music files that may have been lost or incompletely downloaded in the initial communication. The FAQ indicates that the user is supposed to get confirmation emails containing direct download links in case they need to re-download, but in testing,



Let your fingers do the walking: ninemsn offers detailed walkthroughs and tours.

Ready when you are: each track on ninemsn Music is available for on-demand streaming.

none of these confirmation emails arrived.

Because ninemsn Music is serviced by OD2, a

UK-based company providing on-demand distribution to a large number of British and European merchants, the download manager can be used with all of these services. This makes it a very attractive option if you download a lot of music.

Rather than listing prices in monetary figures, ninemsn has chosen to go down the credits road. Credits roughly equate to cents, so the typical track price of 189 credits is close to the \$1.89 price offered by some other services. The main advantage of the scheme is the discount when purchasing large blocks of credits, the best offer being a two-for-one deal when you spend \$100. This effectively reduces the price of each track to around half that of ninemsn's competitors.

Another option that sets it apart is the one-off streaming of a track for just a few credits (five at the time of writing). This is an attractive feature for those on a tight budget who want to hear a favourite song immediately, or just want to hear a full preview before they buy. Alternatively, you can listen to a free 30 second preview which pops up in a small window at the bottom of your browser.

Ninemsn is easily the most consumer-friendly site. It has an excellent walkthrough tour to introduce newcomers to the world of

MuleMusic takes on big boys

A new Australian online music store launched just as APC went to press. MuleMusic (www.mulemusic.com.au) currently has 180,000 tracks from the EMI/Virgin and Festival/Mushroom labels. Don't expect to find all their artists, however. In testing there were many artists listed on both companies' Web sites who weren't yet available on MuleMusic. The site is also sparse on extra information, such as artist biographies and album cover notes. It's likely this will be updated soon.

MuleMusic is a Microsoft shop all the way: you need to run Internet Explorer for Windows to get into it, and the downloads are only available in Windows Media Audio 9 format.

Tracks cost \$1.99 each, though complete albums can be purchased at substantial discounts. For instance, it would cost \$25.87 to buy all 13 tracks from Norah Jones' *Feels Like Home* album individually, but buying the whole album costs just \$16.99. This is a saving of \$9, and around two-thirds of what you'd pay in the shops.

For downloaded tracks, you are permitted three transfers to portable devices, three burns to compact disc and unlimited playback on one PC.

Dan Warner

digital media purchasing, plus a detailed Help section and toolkits wherever appropriate. BigPond offers no help, and Destra only offers a small key that can be easy to miss.

Details

Online <http://music.ninemsn.com.au>

Price \$0.90-\$1.89 per track depending on credit package

✓ Good selection of music; excellent interface; direct one-time streaming.

✗ Hard to re-download if initial download fails or file is lost due to confirmation emails not being sent.

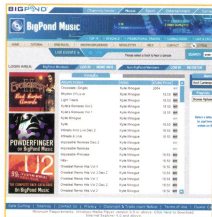
Verdict ★★★★★

BIGPOND MUSIC

BigPond has the best selection of full albums matching the test requests in this review. For instance, the INXS *Remixes* album has 15 tracks; BigPond has all 15 on offer, while ninemsn only has 12 without indicating that the album isn't complete. In addition, BigPond features exclusive live music events where users can stream concerts as they're broadcast on Telstra's site.

The other major selling point for BigPond is its pricing structure. While its normal price for a single track is relatively high (\$1.99), significant discounts are offered in a range of situations. Some of these discounts are only available if the user is also a BigPond subscriber, but each track in the weekly top 10 can be downloaded for just 99 cents.

There were problems downloading the initial licence for the Windows Media Player application in testing — three attempts were required before installation was successful. This issue cropped up on other test machines too, so Telstra may need to implement some



Dive in: all search results are presented in a single scrollable window which can take a while to download.

improvements to its back-end server.

Rather than declaring the DRM information for each track, BigPond Music has a page dedicated to the site-wide DRM rules applied to all music available for download. While this makes it easy to understand once you know where to look, you need to know that there are restrictions to find them in the first place. Like the other two sites, the file can be burned to CD three times and copied to portable players (though only twice rather than the apparent standard of three times).

There are some issues with the site's interface. When you click on the preview button to listen to a track before downloading, the site begins to buffer the audio in the background but doesn't give any visual cues as to what's going on. And there's no file size information for tracks, leaving you guessing as to how long you might be waiting for a song to download.

Details

Online <http://bigpondmusic.com>

Price \$0.99-\$1.99 per track

✓ Broadcasting of live concerts; excellent promotional pricing.

✗ Hard to navigate and little feedback when clicking links; initial licensing issues.

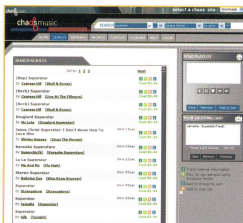
Verdict ★★★★★

DESTRAMUSIC

DestraMusic doesn't offer its services direct to the public. Rather, it looks after the online music catalogues of a number of retailers such as HMV, Sanity, Mp3.com.au, Chaos Music, Leading Edge Music and Dick Smith Powerhouse by hosting each company's downloadable digital media service on its servers — at the time of writing, Destra managed the service for 13 such "etailers". Five of these consumer sites were tested and the same functionality and basic interface were found in each.

Each site has a standard home page with a top 10 and genre list, simple navigation bar and a quick access pane containing a playlist and shopping cart. As you browse through the site, you can add tracks to either of these areas. The playlist stores the 30 second preview clips available for all downloadable tracks. There is a featured section as well as etailer-specific promos but in testing, none of the sites had promotional tracks available.

Although Destra boasts almost 500,000 tracks in its database, it can be difficult to



Musical mall: each track on Destra's etailer sites contains direct links to preview, buy or check DRM information.

find the more popular musicians. Searches for major artists such as Madonna, Midnight Oil and Black Eyed Peas produced no hits. Destra doesn't feature some current artists on its database (such as Spiderbait), but even when you do manage to get a list of results, there is no indication as to how many pages of results you will need to navigate through.

There is no download manager, so you need to make sure your Internet connection can handle the size of your download in a single stream. Because the files are hosted locally, they tend to be slightly faster than ninemsn or BigPond, but some download server issues were experienced at times.

Fortunately, each Destra-based site has a My Music section that allows you to access previously purchased music for additional downloads — by default, you're allowed three downloads included in your purchase. This is a definite advantage over ninemsn, which expects you to get the download first time or pay for it again.

Another major plus with Destra is that the DRM information is easily determined for each track. Along with the description of each track and the shopping cart and preview links there's an additional quick link to the licensing information so you know what you're getting before you purchase. Normally, the purchase includes three transfers to portable players as well as three CD burning opportunities.

Details

Online www.destramusic.com/etailers.asp

Price \$1.44-\$1.99/track depending on etailer

✓ My Music store for additional downloads; promo tracks.

✗ Download server plays up occasionally; track selection not as extensive as other providers.

Verdict ★★★★★

Rock the beat

Andrew Parsons checks out the latest media players for Windows, Mac and Linux.



Bonus CD software

See page 8 for full listing.

When you've got several thousand MP3 files stored on your computer, the last thing you want is software that turns the collection into a jumbled mess, or interrupts the music with "codec not found" errors. With a collection of 2,500 MP3 and WMA files, APC went in search of the best electronic media players for Windows, Linux and Macintosh platforms.

Apple iTunes 4.6



Details

Contact Apple

Online www.apple.com/itunes

Price Free; Pro, US\$14.95

✓ Superb library management.

✗ No WMA/Ogg playback.

Verdict ★★★★★

iTunes is a tightly integrated package of ripping, automatic tagging from CDDb, library management and burning. It's designed to handle very large collections and has a lightning-fast search function. It also supports automatic generation of playlists based on user-defined criteria.

Network sharing allows other people on your network to access your iTunes library and stream music off your Mac/PC. However, there's no WMA or Ogg compatibility.

A Windows version is also available. WMA files will play if Windows Media Player 9 is installed.



Details

Contact Music Exchange

Online www.musicex.com/

Price US\$24.98 (US\$19.98 if BASIC downloaded first)

✓ Editing features; automatic track cross-fading.

✗ Simplistic visuals; counter-intuitive CD burning.

Verdict ★★★★★

Media Jukebox



Media Jukebox has many bonus features, such as the ability to decode-edit-encode music, and automatic cross-fading of tracks.

Creating the sortable media library only takes a couple of minutes. MP3, WMA, and WAV files are supported.

CD ripping and burning tools are included, as well as the ability to print CD covers and labels. However, the burning feature is overly complicated.

The built-in visualisation device can be placed in a separate window from the main app, but the visuals are too simplistic. The upside is that they don't strain the system.



Details

Contact Softwarium

Online www.softwarium.com/airwhisper.html

Price US\$10

✓ Ease of control; low CPU usage.

✗ MP3 only; fiddly library management; no support for standard format playlists.

Verdict ★★★★★

Air Whisper 1.4.1

Air Whisper is one of the lightest music players on the Mac — it uses just 7% of CPU resources while playing. The only downside is that it's only compatible with MP3.

Ease of control is Air Whisper's principal strength: its skinnable interface allows the player to sit "always on top" at various sizes, and global keyboard control makes it possible to adjust volume and skip tracks without using the mouse.

However, it's not ideal as a music library manager. Although you can still navigate by artist and album via drop-downs, it's better to set up playlists.

Audion 3



Details

Contact Panic Inc

Online www.panic.com/audion

Price US\$29.95; upgrade, US\$17.95

✓ Broadcasts music streams; CD ripping and burning; iPod compatibility.

✗ WMA files don't play correctly; ID3 tag support issues.

Verdict ★★★★★

Audion 3's intuitive interface gets you rolling without fuss, although despite supporting playlists of virtually unlimited size, very large lists can cause the application to crash. MP3, WMA and AAC files are all supported.

Streaming network audio, encoding, editing, mixing, file sorting, CD ripping and burning options all feature. Tracks can also be transferred directly to an iPod.

Information such as ratings and equaliser settings are missing from ID3 tags. Despite WMA support, these files don't play correctly — tracks skip and glitches are evident.

mp3blaster



Details

Contact Bram Avontuur

Online www.stack.nl/~brama/mp3blaster

Price Free

✓ Random album option; low system requirements.

✗ No fancy graphics; minimal feature set.

Verdict ★★★★★

If you're after a basic MP3 player for a Linux, Unix or BSD system, it's hard to go past mp3blaster. Although it's only text-based, mp3blaster includes all the basic playback controls and some elegant extra features such as random play of entire albums.

Thanks to its non-graphical interface, mp3blaster has meagre system requirements: it'll run on any system sporting at least a 120MHz processor and only demands that ncurses and OSS are preinstalled.

mp3blaster can't play WMA files, but has no problems with WAV, MP3, or Ogg audio. Unfortunately, there are no CD ripping or burning options.

MPlayer



Details

Contact	The MPlayer Project
Online	www.mplayerhq.hu
Price	Free
✓	WMA compatible; video playback.
✗	Known bugs in some versions.
Verdict	★★★★☆

MPlayer is Linux's all-singing, all-dancing answer to Windows Media Player. It supports a wide range of audio and video formats, including MPEG, VOB, AVI, Ogg/VIVO, VIVO, ASF/WMA/WMV, QT/MOV/MP4, FLI, RM, NuppelVideo, YUV4MPEG, FILM, RoQ and PVA. A full list of codecs can be found at www.mplayerhq.hu/homepage/codecs-status.html.

The interface is slick, and like many Windows players, it's also skinnable. It's possible to extend the program's functionality by downloading extra codecs. A beta version is available for Windows.

lin



Details

Contact	Team Sonique
Online	http://sonique.lycos.com
Price	Free
✓	Great selection of visual plug-ins.
✗	No CD ripping or burning; no media library or playlist management.
Verdict	★★★★☆

Sonique 1.96

win

Sonique is let down by some programming problems and the lack of any CD burning capabilities, or option for sending tracks to portable music players. Creating playlists is irksome, and there are no automatic media locating tools.

However, Sonique's interface is clear, intuitive and it has the best visual effects plug-ins in the roundup (download them from <http://sonique.lycos.com>).

The graphic equaliser allows for multiple presets but is too limited to provide any real benefits other than to set up your speaker system. Version 2 is currently in beta stage.



Details

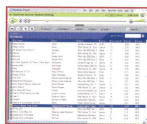
Contact	Microsoft
Online	www.microsoft.com/windows/windowsmedia/default.aspx
Price	Free
✓	Auto noise reduction; high-fidelity sound.
✗	DRM; basic visuals.
Verdict	★★★★☆

Windows Media Player 10

win

Windows Media Player 10 has the best audio enhancement features of the Windows players tested. Automatic noise reduction and SRS WOW Effects provide clear separation and definition as well as scaling for PC/stereo speakers and headphones.

All standard file types are supported, as well as Unix AU and SND, video and DVDs. Files can be copied to portable devices and burned to CDs, but the DRM limits your ability to share files. The playlist system allows multiple files to be selected for burning.



Details

Contact	RealNetworks
Online	www.real.com
Price	US\$19.99
✓	Simple to use; menu-driven CD burning.
✗	Media library creation is slow.
Verdict	★★★★☆

RealPlayer 10

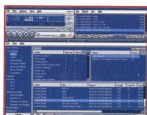
win

RealPlayer now supports WMA, but an additional download of the WMA codec is required to import and play WMA collections.

Library creation takes almost as long as Winamp. The library is sortable, but since there's no Explorer-style tree view of the media, the function is practically useless.

CD burning is done with an intuitive menu system. RealPlayer can also send music tracks to portable devices.

The software crashed twice in testing, then completely locked up after playing a few tracks, requiring a physical reset.



Details

Contact	Nullsoft
Online	www.winamp.com
Price	Free; Pro version, US\$14.95
✓	Good control over how music is sorted; video playback.
✗	Takes too long to generate media library; some errors in testing.
Verdict	★★★★☆

Winamp 5.05

win

Winamp has lost some appeal in its latest version. Creating a media library is up to 10 times slower than other products in this roundup and errors were generated each time the app was launched during testing.

The library is sorted according to a variety of preset filters. A separate playlist window allows creation of individual playlists. No CD burning or ripping options are available in the free version, but the Pro version adds CD burning and MP3 ripping/encoding. The simplistic graphic equaliser is ineffective. Video playback is an extra touch not offered by some of the other players.

XMMS

lin

If you're only after background audio with straightforward and easy access to functions, XMMS is ideal. The app includes an integrated



Details

Contact	4Front Technologies
Online	www.xmms.org
Price	Free; Pro version US\$14.95
✓	Styled after Winamp; long list of plug-ins.
✗	Simplistic equaliser; no CD ripping or burning.
Verdict	★★★★☆

graphic equaliser and playlist window, which stay attached to the main window when opened. The equaliser is a little simplistic, but it's good for establishing the best sound settings for your speaker system.

By default the player can only handle audio CD, WAV and MP3 files, but a long list of additional file type plug-ins can be downloaded to expand this list as needed. Another area of the player that requires plug-ins to be downloaded are the visualisations. There are no CD ripping or burning options.

Come Clean

Once you've taken your music on vinyl LP or cassette and transferred to digital format, how do you strip out the unwanted snap, crackle and pop? Drew Turney has the answer.

Archiving old LPs or cassettes in digital format is a great way of revitalising your music collection, but the sound quality often isn't up to the standard we've come to expect. Pinnacle Systems' Steinberg Clean 4.0 (included on this month's cover CD set) is an application that strips out unwanted background noise, making your golden oldies sound as pristine as the day they were recorded.



Bonus CD software

Steinberg Clean 4.0

Skill level

Beginner

Requirements

Windows 98SE or later

Time to complete

One hour (approx)

Inside info

■ Steinberg Clean

www.pinnaclesys.com

MUSIC IN THE RAW

Steinberg Clean aims to create a track list for export to either your hard drive or onto a data or music CD. To begin, install the software and open a new project. This is where you'll collect and modify the tracks into a single list for export.

Files are imported in either WAV or MP3 format. Alternatively, you can record analog music straight from a turntable or cassette player through a preamp and into your sound card. Digitising music in this manner has already been the subject of an APC Workshop (see "Be sharp", APC July, page 135).

Importing tracks is as simple as clicking the Import menu and selecting each track from your hard disk or CD. Next, organise the structure of the final output. You can do this in much the same way as you would in any music player — use the track list window to arrange or rename tracks by dragging or double-clicking. You can also specify the duration of the pause between each track.

SPIT AND POLISH

By dragging appropriate markers on the waveform display, you can change the start and end point of each track, and the fade in and out points. However, the audio effects are the meat of Clean's powers.

DeClicker, DeCrackler and DeNoiser are the major functions under the restoration tab. Apply them at varying intensities depending on the track quality by clicking on the button and dragging the slider, or by typing a numerical value in the box.

DeNoiser contains presets that you can use or add to with the Wavelab application. Wavelab is included with Clean, and allows you to sample a "footprint" of settings from any track and export them back to Clean (where they'll be available in the DeNoiser presets).

Toggle the on/off button of each effect to compare the setting to the original sound. The audition buttons, located to the right of the on/off buttons, allow you to hear the sound that Clean has stripped out using that effect; very handy for identifying aurally what each effect does.

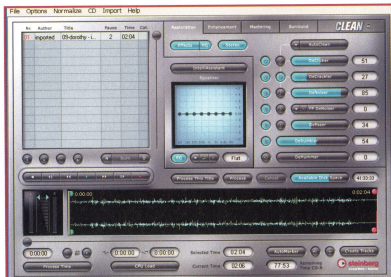
The Enhancement tab effects work the same way. Here, you can apply effects to enhance the harmonics and stereo spread or even optimise the sound for playback in a car. The terminology can get a little tricky, so it's a good idea to experiment. Modify the settings in the same way you did under the restoration tab and see what sounds best. There's even room for two VST plug-ins, both of which are widely available.

The Mastering tab contains all the stuff pros use for preparing tracks. The button sliders here alter the speed/pitch, phase correction and loudness — imperative if you have music with a wide dynamic range but don't want to lose the quiet notes.

ENTERING THE REAL WORLD

If you're serious enough to produce output for playback in different environments, you'll probably get use out of the extra features, including the equaliser and surround sound settings. By this time, however, most users will be ready to export. When you're satisfied with your tracks, click the process button to prepare the project for output.

Before burning, use the normalise function to select the highest level in a track and bring the rest of the track to the same level. This results in increased "punch" throughout the track regardless of loudness. Then click on the CD menu and select to write a data or audio CD. If you save your project, you can modify and output any number of times for the best results in different situations. **CT112**

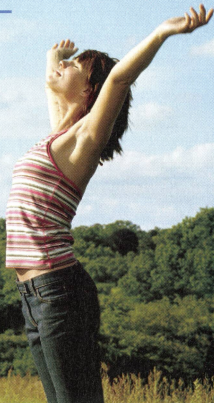


Old is new again: even beginners can get professional results with Steinberg Clean.

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Rock hard

How we tested

Music tests by nature have a subjective component. All listening tests were performed by the same person using Sony's MDR-EX71SL N.U.D.E EX Fontopia in-ear phones. The fit and quality of bundled earphones was also checked. Listening tests were performed using the same electronic, rock and classical tracks for each unit.

Software was tested on an Athlon XP 2800+, with 512MB RAM and a Western Digital WD1200BB hard drive. All transfer tests were performed via USB 2.0, either directly from the player (where supported) or via Windows.

Storage capacity was tested with a 1GB collection of MP3 files at bitrates between 128Kbit/s and 320Kbit/s, as well as variable bit rate quality. Ogg Vorbis test files were encoded at Quality 10. Windows Media Audio (WMA) files were encoded at 256Kbit/s and variable bit rate quality.

Whether you're at work, on public transport, or in the gym, MP3 players are a popular option for personal music on the go. Nick Race looks at nine of the best.

The Apple iPod is synonymous with MP3 players. Not only was it the first hard drive player on the market, its small size, neat design and easy control quickly ensured its popularity. However, a number of companies are now pushing the iPod for the hard drive player pole position.

And rather than just dropping prices to compete, manufacturers are offering longer play times, extra functionality and innovative control mechanisms. At the top end of this market, devices are mobile entertainment units rather than just places to store your music collection.

FIGHT FOR YOUR RIGHTS

Digital Rights Management (DRM) is a hot issue with portable players. Without it, it's hard to envision legal music download services such as Apple's iTunes and Roxio's Napster 2.0. Now record companies can protect their product from piracy and offer music that's locked to certain users.

TUNING PERFORMANCE

A number of players on the market include built-in FM radio tuners, and a few allow recording from the FM tuner for later playback.

FITTING IT ALL IN

Ensure the player you choose has sufficient storage to hold a large enough variety of music to last until

the next PC synchronisation. Pick a size based on the number of tracks you can't live without and how often you can take the time to update the content.

CHARGE!

The majority of units now include rechargeable Lithium-ion or lithium-polymer internal batteries that recharge when the player is docked. This does away with the need to purchase a new set of batteries after 10 or so hours of playback. The downside is that when the supplied internal battery can no longer hold a charge, getting a replacement may be expensive or impossible. And if you run out of juice when you're out and about, you're out of luck.

EARACHE

Though the sound through supplied headphones or earbuds is often quite acceptable, they can be uncomfortable when worn for long periods. Put money aside for a pair that suits your requirements. Turn to page 92 for our recommendations.

TOYS FOR TOYS

Docks, FM transmitters, modification kits, car cradles, battery rechargers, arm bands and remote controls are just a taste of the cool accessories available. Before choosing a unit, make sure the add-ons you want are available.

Apple iPod 20GB

Up till now, Apple's iPod was the best-selling portable music player, but it lacks voice recording, a line-in port and a radio — features that can now be seen in some competing devices. It measures 10.4 x 6.1 x 1.85cm and weighs 160g.

Despite its style, the iPod has some quirks that keep it from being the "ultimate" player. The circular control pad for navigating menus integrates the play/pause, skip and previous buttons. Scrolling through long lists of tracks can become a chore with the control pad — you'll get frustrated swirling your finger around when you're searching through 10,000 songs. Scroll too fast and the LCD struggles to keep up, leaving the track names unreadable.

The system connects to a PC via FireWire (or USB 2.0 via an optional \$59 dock) and uses Apple's iTunes

software, available on Mac OS X and Windows. All files are ordered by ID3 tags.

Transferring 1GB of files to the iPod took two minutes and 13 seconds. The player also appears as a removable disk in a PC's file system so you can transfer of data on and off its 20GB drive (a 40GB version is also available for \$649). Apple claims up to 12 hours of playback, but 10 can be expected.

Supporting only a single headphone out (with an in-line remote control connector), the iPod has no recording capabilities, although optional accessories can provide these functions. A basic calendar and useful contact database are offered.

The iPod's sound quality is excellent, but while the supplied earbuds are reasonably good, it would benefit from a better pair of headphones.



Details

Contact	Apple
Online	www.apple.com.au
Phone	13 36 22
Price	\$499



Excellent sound and manufacture quality; compact.



Lack of input and outputs; low-quality LCD.

Verdict



Archos Gmini 220 20GB

Archos' Gmini is almost as small as the Philips HDD060, but its 20GB hard disk drive can store over 13 times the capacity of the Philips player. The unit measures 7.8 x 6.7 x 2.3cm and weighs 170g.

The Gmini 220 includes an MP3 voice recorder, plus recording via line-in (with included stereo RCA cable). It also supports data transfer from the unit's built-in CF card slot — very handy when you're away from your PC. A monochrome 160 x 160 resolution backlit LCD takes up the majority of the Gmini's front face and doubles as a photo viewer.

The picture viewer function is extremely basic and is more useful for identifying sequentially named photos from a digital camera than as portable photo viewer. The Gmini's 20GB storage is also useful for transferring files; there aren't many

portable hard drive enclosures this small.

Controlled with a four-way rocker and three buttons, navigation is very simple. Based on a tree structure, similar to a DOS-based operating system, the player can be a little slow traversing directories and bringing up file information. The software bundle includes MusicMatch Jukebox 8 and a playlist manipulation and playback application.

Transfer tests through MusicMatch took 14 minutes and 50 seconds to transfer 1GB of files via USB 2.0 connection. A direct transfer through the Windows file manager took only one minute and 30 seconds. The Archos boasts 10 hours' battery life.

The sound quality of the player is excellent, and the Gmini ships with a functional pair of earbuds. An optional FM tuner can be added for \$106.14.



Details

Contact iTech International

Online www.itechinternational.com

Phone (02) 9261 8101

Price \$675

✓ Very small; great sound quality; CF slot; voice recording.

✗ Slow to traverse menus.

Verdict ★★★★★

Creative Zen Touch 20GB

Creative Labs' Zen Touch takes the iPod's crown. Incorporating a few of the features that make the iPod so popular, it takes the iPod's circular touchpad and turns it into a linear menu tool. This allows users to scroll through long lists of tracks or albums much more quickly. It measures 10.5 x 6.9 x 2.2cm and weighs 202g, making it slightly larger than the iPod.

The touch strip can also be set for tap selection. Side-mounted power and volume buttons are inset to avoid unintended presses. Track navigation breaks the collection into artists, album, playlists or tracks. The backlit display makes it easy to navigate through the menus in dim environments.

Creative has put together a comprehensive software bundle consisting of MusicSource, which

supports encoding of CDs into MP3 and WMA, playlist management and transfer of tracks. Music and data can be directly imported via an installed Zen Touch icon under My Computer (Windows XP). Using the MusicSource software, 1GB of MP3 files were transferred in three minutes and 55 seconds over the USB 2.0 interface.

The Zen Touch's 20GB hard drive can also be used to transfer and store files other than music. Unlike the iPod, MP3 files can be transferred on and off the Zen without the use of a driver or application.

The earbuds included with the player are reasonably comfortable, though they won't suit those with smaller ears. An FM tuner and in-line remote control are also supplied. The Gmini 220 offers around 24 hours of battery life.



Details

Contact Creative Labs

Online <http://au.creative.com>

Phone (02) 9021 9800

Price \$499

✓ Excellent navigation and control; high-quality playback; plug and play transfers.

✗ Slow transfer speed.

Verdict ★★★★★

Toshiba shrinks hard drives again

Apple's iPods originally used Toshiba drives but now use Hitachi 1.8in hard disks, while the iPod Mini uses a 1in version with a 4GB capacity. As a form of revenge, Toshiba may be planning to trump Apple with a music player based on the smallest hard drive ever made.

The new drive is roughly the same size as a Secure Digital memory card, with an 0.85in disk platter. Prototypes can store 2GB, but Toshiba expects to have a 4GB version available by the middle of 2005, and 10GB by the end of next year.

Analysts believe the relationship between Apple and Toshiba soured when Toshiba announced its own hard drive-based music player in 2002.

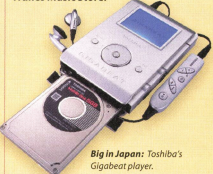
Toshiba is now up to its second generation of Gigabeat music players, offering the same 5GB, 20GB and 40GB capacities as the iPod range.

The players are only available in Japan, but analysts are betting the company is readying new models based on the 0.85in hard drive technology for wider release. The first of these players is expected in stores internationally in 2005.

The 0.85in hard drive also gives mobile phones and PDAs the ability to become fully-featured music players with high capacities.

Although not using the new Toshiba hard drive, Motorola has announced a

phone that can synchronise music on its internal memory with iTunes, including songs purchased from the iTunes Music Store.



Big in Japan: Toshiba's Gigabeat player.

**Details**

Contact CR Kennedy

Online www.crkennedy.com.au

Phone (03) 9823 1555

Price \$689

✓ Colour screen with picture viewer; 20mW output; can act as USB host.

✗ Bulky.

Verdict ★★★★★

**Details**

Contact JNC Digital

Online www.jnc-digital.com.au

Phone (02) 9264 8677

Price \$599

✓ Small; excellent sound quality.

✗ Terrible control interface; must use in-line remote.

Verdict ★★★★★

iRiver H320 20GB

The H320's most notable feature is its 2in LCD screen with 260,000 colours. Digital cameras can be connected to the device directly via USB 2.0, and files transferred for storage on the player's ample 20GB hard drive. All these features affect the physical size, however — the H320 weighs 183g and at 10.3 x 6.2 x 2.2cm is one of the chunkier players in the roundup.

Like the Xclef HD-800, the iRiver doesn't use proprietary software to transfer data. Once plugged in to a PC via USB 2.0, it appears as a removable drive in the file system. The player ships with management software, and Winamp playlist support is included to help simplify organisation. A set of buttons on the front controls the unit. Menu navigation, however, takes some getting used to.

MP3s are encoded via the line-in port, making transfers from CD players or stereo systems a cinch. Voice recording also features, plus a fantastic AutoSync function, which automatically encodes and stores music in MP3 format.

The H320 transfers 1GB of MP3s in one minute and 30 seconds in testing. The device is compatible with Windows 98SE, Me, 2000, XP and Mac, and it manages around 16 hours of MP3 playback before a recharge of the lithium-polymer battery is required.

There's plenty of power (20mW per channel at maximum volume), which is adequately handled by the bundled earbuds. Add a larger pair of enclosed headphones, however, and this player really excels. A 40GB model, the H340, is available for \$789.

JNC SSF-M3 20GB

This player can be summed up in four words: stylish design, clumsy interface. It measures 10.4 x 6 x 1.4cm and weighs 136g, which is certainly small for a 20GB unit (a 40GB unit is also available for \$699). Unfortunately, this isn't due to smart engineering as the M3's interface is located on an in-line style remote — the body of the player is almost useless without it. Though in-line remotes can be useful for players in backpacks, the M3's remote has a thick and fairly short 60cm cable.

The remote idea isn't a bad one, but when combined with the terrible user interface, it's a chore to use. Volume, play, pause, fast forward, reverse and menu navigation commands are combined on two rocker switches. The use of each switch and how

long each button must be depressed depends on the menu's context. The LCD is limited to four lines.

The player sports a USB 2.0 interface and two software packages are bundled — JetShell and JetAudio. JetShell is the unit's playlist, playback and transfer utility. JetAudio is an additional audio and video playback package. In testing, 1GB of MP3 files took one minute and 35 seconds to transfer. Fourteen hours battery life can be expected.

On-the-fly MP3 encoding is possible via line-in. Other features include voice recording and a built-in FM tuner which can record.

The supplied headphones sound reasonable but are extremely large. Audio quality is top shelf, and the built-in bass enhancers add a little extra oomph.

Rock solid state

Solid state MP3 players — which use lower capacity but smaller flash memory chips to store files — have taken a back seat to the pure storage power of hard drive-based units. Though flash-based technology is becoming more available thanks to the falling price of non-volatile RAM and improved storage capacities, the disparity between megabyte and gigabyte storage is still a strong factor influencing player sales.

That said, flash-based players have two major advantages over their hard drive competitors. As they don't need to accommodate the relatively large mechanical systems found in hard disk drives, flash-based players can be very

compact. Most flash players are small enough to hang on a key chain or slip into a pocket with ease. The Creative MuVo NX, for instance, is designed around a similar form factor to USB flash drives.

One of the great advantages of flash-based devices is that they contain no moving parts, meaning they can keep on playing when exposed to unfavourable conditions. Compared with the fragile nature of optical and hard drive-based players, flash devices are more suitable for those on the go.

However, the limited storage capacity (commonly 256MB) and generally inferior headphone amplification of solid state players can be annoying. For users who don't get to a PC to update their music collection often, being stuck with the same half dozen albums can get boring. Similarly, some people prefer the comfort and sound quality of big, enclosed headphones, and may be disappointed by the low volume output from low-powered players and their supplied earbuds.



Mini MuVo: Creative's MuVo NX is a great miniature player.

A Perfect Blend of Audio/Video Performance and Style

ASUS
www.asus.com.au



ASUS recommends Microsoft® Windows® XP Professional for Mobile Computing.

SMOOTH. GROOVY. STYLISH. PRACTICAL.

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Slim Design equipped with **TV Tuner, Remote Control, Subwoofer & Wide Screen.** Get ready for show time.



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Cache: 1 MB L2
Intel® 855PM Chipset
Intel® 2200BG Wireless Network Connection
ATI Mobility™ Radeon™ 9600*
15.4" WXGA TFT Display-Wide Screen
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4 in 1 Card Reader
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Includes ASUS Optical Mouse & Carry Bag

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**Details**

Contact	Philips
Online	www.philips.com.au
Phone	1300 651 993
Price	\$449.95
✓	Excellent sound quality; small size.
✗	Slow transfer speed; basic features; minimal storage.
Verdict	★★★★☆

Philips HDD060 1.5GB

Philips' tiny HDD060 weighs just 95g and measures just 8.5 x 5.5 x 1.8cm. Unlike the similarly-sized Archos Gmini, however, the HDD060 is only capable of storing 1.5GB of MP3s.

A 1GB collection of tracks took 49 minutes and 50 seconds to transfer in testing, which is much slower than other units in this roundup due to the HDD060's USB 1.1 interface. It also acts as a portable hard drive, appearing as a removable drive in the file system. However, Philips' Digital Music Manager (DMM) software must be used to directly transfer MP3s to the player.

Though other players have similar limitations, DMM has developed a reputation for its quirks and problems. During testing, DMM functioned as it's meant to, however the package's reliance on ID3

information within MP3 files means users will have to make extensive updates to their MP3 tags.

The player's control mechanism is very basic, offering a menu with playlists, artists, albums, genres and a listing of all available files. It's possible to arrange long lists in alphabetical order, making them quicker to search through. The side-mounted menu button brings up settings, a sleep time and a shuffle/random mode. There are no recording functions on this unit.

The HDD060 has excellent sound quality, though some might find the earbuds uncomfortable. This player will suit someone who wants a player with a smaller form factor and doesn't require a large storage capacity. The battery provides around 10 hours' playback before a recharge is required.

**Details**

Contact	Bluechip Infotech
Online	www.bluechipit.com.au
Phone	1800 803 802
Price	\$499
✓	Fast data transfer; SD/MMC slot; voice recording.
✗	Poor software package.
Verdict	★★★★☆

S-Media CoCoPod 20GB

This device incorporates a nice touch for digital photographers on the go: an SD/MMC card slot for transfer of pictures from a digital camera to the larger storage space available on the player. The 20GB drive also has plenty of space for music and other files, though weighing 158g and measuring 11.2 x 6.9 x 2.2cm, it's too bulky for a shirt pocket.

A USB 2.0 connection transfers 1GB of MP3s in one minute and 27 seconds. This is very quick, but there's a catch. The CoCoPod can't play the files until the Playlist Editor's "Update Database" function is run with the player connected to the PC. This took another three minutes and 20 seconds. Compared to the functionality of iTunes and MediaSource, the S-Media software is sorely lacking.

The control interface on the CoCoPod is one of its strong points. The player uses a clickable roller to navigate lists and also includes play/pause, volume and seek buttons. The menu system is intuitive, making navigation through artists, playlists, albums and track listings a breeze.

The player manages eight hours of playback time, but is slow to change tracks—it takes two to three seconds to start playing the next track if you scroll through a playlist. This isn't really an issue during normal playback, but becomes evident when forwarding through lists.

The CoCoPod is packaged with a pair of ordinary but usable earbuds, is capable of voice recording via a built-in microphone and has audio line-in.

AirPort Express cuts speaker wires

Apple's latest music gadget, the \$219 AirPort Express, is defining a new niche: wireless playback of music from your PC.

iTunes is used on PC or Mac to play music to the AirPort Express via an 802.11g wireless connection. The AirPort Express in turn outputs analog sound to a stereo or powered speakers.

If you have multiple AirPort Express units, you can play direct music to different parts of the house or office (from multiple PCs or Macs if you like).

Its design is deceptive: although the sound output looks (and operates) as a 3.5in mini-DIN headphone jack, if you connect the right Apple cable, it turns into a coaxial TOSLINK connector

for digital surround sound.

Apple Computer Australia's Geoff Winder told APC that AirPort Express was a platform on which other developers could create applications with wireless sound. But he was unable to provide specifics of how the AirPort Express communication protocol worked.

Meanwhile, Norwegian hacker Jon Lech Johansen, famed for breaking DVD CSS copy protection, has cracked Apple's AirPort Express encryption, publishing the protocol on his Web site. Johansen was also first to release an alternative program to Apple iTunes that would play music wirelessly to the AirPort Express, dubbed JustePort.



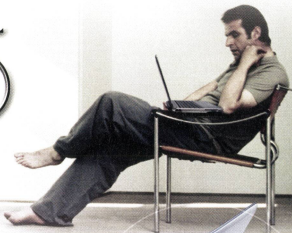
Plug it in: Apple's AirPort Express device makes beautiful music, without wires.

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M5N

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Colour: Black / Pearl White

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Clock Speed: 1.50/1.60GHz
Cache: 1 MB L2
Intel® 855GME Chipset
Intel® 2200BG Wireless Network Connection
12.1" XGA TFT Display
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Dorhan Support
Includes ASUS Optical Mouse,
AI Flash Drive and Carry Bag



* Using the optional 9 cell battery and the advantage of the ASUS Power4 Gear+ on Maximum power savings setting. The notebook comes standard with a 6 cell and a 3 cell battery.



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**Details**

Contact	Sony
Online	www.sony.com.au
Phone	1300 720 071
Price	\$399 + \$9.95 per 1GB Hi-MD
✓	Excellent playback quality; compact.
✗	Takes a long time to re-encode files; battery sold separately.
Verdict	★★★★☆

Sony MD Walkman MZNH600

Sony's MZNH600 is an excellent player let down by a restrictive file encoding system. Though it uses optical discs and isn't strictly an MP3 player, it offers the same functionality.

The new Hi-MD standard offers 1GB of storage per 6.8 x 7 x 0.4cm magneto-optical disc. That may not sound like much, but Sony's ATRAC3 music compression algorithms can squeeze plenty of songs into the space while maintaining high quality sound. In the medium quality mode, roughly equivalent to a 128Kbit MP3 file, the MZNH600 can store approximately 34 hours of music per disc.

The major annoyance with the MZNH600 lies in the length of time it takes to transfer MP3 files onto the player. The bundled SonicStage software re-encodes tracks from MP3 or CD audio into

ATRAC3 (or ATRAC3plus) format before transferring. Although it takes a long time, files only need to be converted once. The 1GB test collection of MP3s took 57 minutes to encode and transfer in tests via USB 1.1. After re-encoding, the files use less than one-third of the player's capacity. The LCD panel is limited to three lines, making navigation and selecting a song or album from a long list a chore.

Basic Sony earbuds are supplied. Audio quality is acceptable at 64Kbit and exceptional in 256Kbit mode. Recording capabilities include optical and analog inputs, but there's no voice recording.

The MZNH600 measures 7.7 x 8.4 x 2.9cm and weighs 145g with battery fitted (101g without). The device offers up to 27 hours of battery life, and runs on a regular AA battery.

**Details**

Contact	mStation.com.au
Online	www.mstation.com.au
Phone	1300 131 035
Price	\$499
✓	Good sound; play and play functionality.
✗	Counter-intuitive navigation; low-quality LCD.
Verdict	★★★★☆

Xcfe HD-800 20GB

Xcfe's HD-800 represents the middle ground in storage for current hard disk-based devices. At 9.9 x 6.7 x 2.2cm and 180g, it's around the same size as the Apple iPod and the Creative Zen Touch. The default configuration is with a 20GB drive, though this is expandable to 60GB.

A D pad-style button controls play, pause, fast forward and rewind, a rocker switch moves through lists of tracks and menu selections, while four brightly-lit extended buttons on the side access the menu, recording and volume adjustment. The backlit LCD screen showed a number of problems such as streaking and echoes of screen images.

The HD-800's interface makes it easy to navigate a collection of MP3s, but only if properly organised. The tree-style directory structure used for choosing

songs should be familiar. A number of other functions are available through the menu button, including an FM tuner, voice recording via built-in microphone, and text file reader.

No software is supplied apart from a driver for Windows 98SE, though Windows 98, Me, 2000, XP and Mac are supported. The player appears as a removable drive on the PC, and files and music can be copied with ease via USB 1.0, 1.1 or 2.0.

A 1GB collection of MP3s took one minute and 40 seconds to transfer in tests. The player boasts around 16 hours of battery life for MP3 playback, and supports version 1 and 2 ID3 tags.

In listening tests, the HD-800 performs very well, though the bundled earbuds may be uncomfortable for extended listening.

Music in the air

SLIM DEVICES SQUEEZEBOX

There's plenty of power in this open source music machine from Slim Devices. The server software finds all manner of music on your PC and the Squeezebox grabs it via Ethernet or Wi-Fi. The control method is a bit finicky, but nothing a bit of practice won't fix.

Upsides: it looks pretty techy, with a bright green VFD visible from anywhere in the room. It'll play MP3, AIFF, FLAC, Ogg, AAC and all other letters of the alphabet. If you're too lazy to get to the remote, you can also control it from the PC. Songs can be added to your playlist from the remote.

Downsides: confusing control interface.

Details

Online	www.wickedigital.com.au
Price	\$549
Verdict	★★★★☆

NETGEAR MP101

Upsides: the grey exterior and super-bright LCD make the Netgear MP101 look like a serious piece of hi-fi kit. Even the most technologically incompetent can set up and control this baby. Remote control included.

Downsides: only MP3 and WMA? What is this, 2002? And you can't make or add songs to playlists on-the-fly.

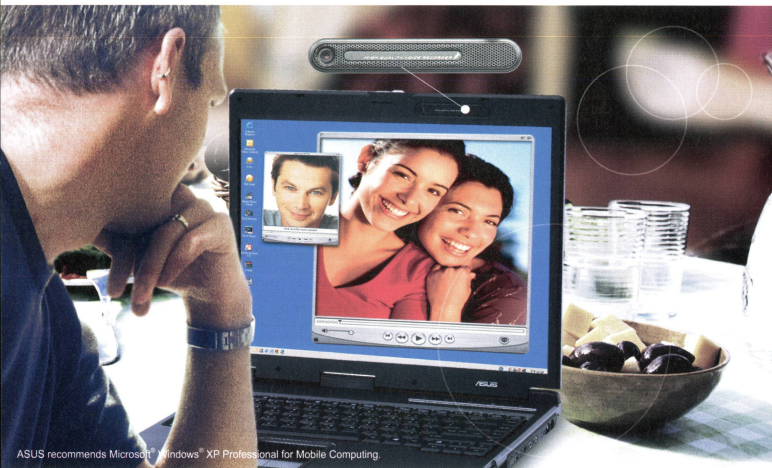
**Details**

Online	www.netgear.com.au
Price	\$349
Verdict	★★★★☆



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15" XGA TFT Display
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A3



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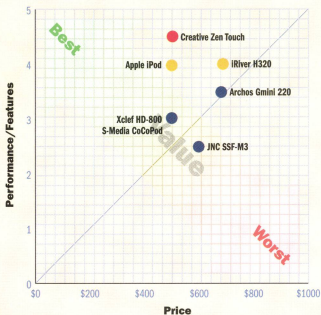
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apc price-to-performance ratio



The Creative Zen Touch easily claimed the Editor's Choice award. The array of features available combined with its ease of use and high-quality build and output set it apart from the other players in the roundup. Though the iRiver H320 also performs well, its counter-intuitive interface kept it from taking the crown. However, it clearly deserves the Highly Recommended award.

Four of the players in this roundup are priced at \$499, though the differences between the Zen Touch and similarly-priced devices are astounding.

Sony's MZNH600 and Philips' HDD060 aren't included in this chart as they only have capacities of 1GB and 1.5GB respectively.

Sound in, sound out

There are four main varieties of headphones. The most common variety is the earbud, the type usually provided with an MP3 player. Sitting in the hollow of the ear without impeding the canal, many people find them uncomfortable for long periods. However, their low cost and reasonably good sound reproduction make them attractive. Sony's Fontopia earbuds has a good reputation, as does Sennheiser's range of earbuds and headphones.

In-ear 'phones are similar to earbuds, but typically have a soft silicon sheath and are inserted into the ear canal. They're much more comfortable than they sound. The benefit of in-ear 'phones is increased comfort and better bass reproduction thanks to the enclosed audio environment. Apple has been selling in-ear headphones with its iPod range, though they aren't limited to use with Apple products. Sony's MDREX71SL model is an excellent choice at \$99, but if you have a little more cash in your budget, Etymotic's ER-4P in-ear 'phones (US\$330) are renowned for their sound quality.

Larger headphones are finding popularity again, both for listening at home, in front of the computer and on the move. There are two varieties available, the first being the generally smaller "open"-style 'phones, which allow external sounds in (and your music out). They usually sit on top of your ears, though circumaural (around the ear) models are available.

The second type is the "closed" headphone. They make a firm seal against the side of the head and reduce or remove external sound influences — great for enjoying music in noisier environments. However, their bulky size means they're often left at home. Sennheiser's HD range, Bose's TriPort headphones and Sony's HIFI range include both open and closed models.

Hard disk player specifications

Manufacturer and model	Sony MZNH600	Philips HDD060	Xclaf HD-800	Creative Zen Touch	S-Media CoCoPod	JNC SSF-M3	Apple iPod	Archos Gmini 220	iRiver H320
Price	\$399	\$449.95	\$499	\$499	\$499, \$699	\$599, \$699	\$499, \$649	\$675	\$689, \$789
Storage size	1GB discs	1.5GB	20GB	20GB	20GB, 40GB	20GB, 40GB	20GB, 40GB	20GB	20GB, 40GB
Format support	ATRAC3, ATRAC3plus	MP3, WMA	MP3, WMA, Ogg, WAV	MP3, WMA, WAV	MP3, WAV, WMA	MP3, WMA, Ogg, WAV, ASF	AAC, MP3, WAV, AIFF	MP3, WAV, WMA	MP3, Ogg, WMA, ASF
Weight	145g	95g	180g	202g	158g	136g	176g	170g	183g
FM tuner	No	No	Yes	Yes	Yes	Yes	No	No	Yes
Carry case included	No	Neckstrap	Yes	Yes	Yes	Yes	No	No	Yes
Dimensions (HWD, cm)	7.7 x 8.4 x 2.9	8.5 x 5.5 x 1.8	9.9 x 6.7 x 2.2	10.5 x 6.9 x 2.2	11.2 x 6.9 x 2.2	10.4 x 6 x 1.4	10.4 x 6.1 x 1.8	7.8 x 6.7 x 2.3	10.3 x 6.2 x 2.2
Battery type	AA	Li-ion	Li-ion	Li-ion	Li-ion	Li-ion	Li-ion	Li-ion	Lithium polymer
Battery life (hours)	27	10	16	24	8	14	12	10	16
Connection (USB 1.1, 2.0, FireWire)	USB 1.1	USB 1.1	USB 2.0	USB 2.0	USB 2.0	USB 2.0	USB 2.0/FireWire	USB 2.0	USB 2.0
ID3 support	Converted equivalent	V1, V2	V1, V2	V1, V2	V1, V2	V1, V2	V1, V2	V1, V2	V1, V2
Bundled headphone type	Earbuds	Earbuds	Earbuds	Earbuds	Earbuds	Earbuds	Earbuds	Earbuds	Earbuds

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• For more information: <http://event.asus.com/A730/>
The display image shown is for illustration purpose and may not bear any resemblance to reality.

Sound solutions

Nick Race looks at three cards with very different price tags to see how far your dollar will go.

Despite their prevalence, an onboard sound solution will never match a dedicated soundcard for quality or performance.

The majority of soundcards available today can be divided into two categories. The first group revolves around audio productivity for music creation, recording or editing. Cards of this ilk are typified by low audio latencies and a multitude of professional or semi-pro connector types, especially inputs, such as MIDI, XLR and optical ports.

The second group of cards is based on music and home theatre playback, as well as providing support for various 3D game sound libraries. Typically, these soundcards support several speakers and outputs but only a few inputs.

A third type of device is also emerging: USB-connected soundcards for notebook and desktop users. Though USB-connected cards have historically been aimed at the portable market, manufacturers have started to use the extra space available on the external device to add more connectors and features.

Although dedicated soundcards are often seen as an unnecessary expense, the benefits of running a multi-speaker setup, decoding high-quality audio for home theatre and the higher signal-to-noise ratio are worth the money if you want your PC to be an entertainment hub. Dedicated soundcards also take strain off your CPU, a boon for those performing CPU-intensive tasks such as gaming.

Audiotrak Maya 7.1

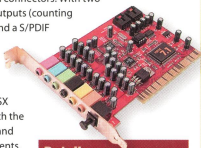
mid-range

Despite its mid-range price, this card is ideal in a high-end home theatre PC. The Audiotrak Maya supports 7.1 speaker channels, 24-bit DVD-Audio, Dolby Digital EX, and DTS ES for surround sound decoding. It also features ASIO sound drivers and the Sensaura game sound library offering EAX 2, A3D and other 3D sound protocols.

Though it doesn't come with an external box like the Audigy ZS, the back of the card is loaded with connectors. With two analog inputs, eight analog outputs (counting single connectors as stereo) and a S/PDIF optical out for digital signals, the majority of high-end speaker systems are well catered for.

Demo versions of Cubase SX and Wave Lab are bundled with the card, as well as Absynth, FM7 and B4 Organ from Native Instruments. A basic but effective sound mixer and volume adjustment panel installs in the system tray on Windows 2000 and XP, allowing the levels on all inputs and outputs to be adjusted individually.

A signal-to-noise ratio of 87dB is ample for most multimedia applications — and excellent at this price point.



Details

Contact	Sound & Music
Phone	(03) 9555 8081
Online	www.sound-music.com
Price	\$149
✓	Plenty of outputs; wide sound protocol support.
✗	Only demo versions of software.
Verdict	★★★★☆

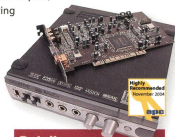
Creative SB Audigy 2 ZS Platinum Pro **high-end**

The Audigy 2 ZS Platinum Pro will suit those who demand sound output of the highest quality or are starting to get serious about music production. It's a THX-certified power card with an external connection box for in/outputs.

Three line outs support speaker configurations up to 7.1 channels, while the external box contains connectors for a range of inputs and outputs including S/PDIF in and out for digital signals, microphone inputs, optical connections, stereo RCA inputs, FireWire and digital out for connecting digital speakers.

The software bundle consists of Audigy 2 drivers and control software, plus Creative's excellent MediaSource application. MediaSource allows quick access to sound mixers, recording functions, volume and speaker control, as well as the MediaSource player and a DVD-Audio player.

Creative's EAX, Dolby Digital EX, 24-bit DVD-Audio playback and DTS ES virtual and true surround sound are all supported. A superb 108dB signal-to-noise ratio ensures the quality of the audio is outstanding.



Details

Contact	Creative Labs
Phone	(02) 9021 9800
Online	http://au.creative.com
Price	\$499
✓	Numerous connectors and controls; DVD-Audio support.
✗	Lacks stereo RCA outputs.
Verdict	★★★★☆

AOpen Cobra AW-850 Deluxe 5.1 **budget**

A low price usually means minimal features, but not in this case. The Cobra is a great all-round card for gaming, surround sound DVD and music playback and most general uses.

Based on the C-Media chipset, mostly sold for onboard solutions, the Cobra is a good buy compared with an onboard solution. It supports a maximum of 5.1 speaker channels and is packed with connectivity options, including standard outputs for front, rear and centre speakers, plus line-in and mic ports and a MIDI/game serial port.

A secondary daughterboard that fits into an adjacent PCI slot cover provides S/PDIF coaxial input and output for digital signals. It also has optical in and out ports.

The software bundle consists of Powerful Audio Rack — a playback and mixer program for adjusting parameters of the card, and InterVideo's WinCinema, which includes a copy of WinDVD 4 and WinRip. These aren't killer apps by any stretch, but handy for watching DVDs. DirectSound 3D, EAX and A3D are supported for gaming.

A signal-to-noise ratio of 82dB is close to the Audiotrak Maya 7.1 — superb for a budget card.



Details

Contact	Bluechip Infotech
Phone	1800 803 802
Online	www.bluechipit.com.au
Price	\$49
✓	Connectivity.
✗	Limited to 5.1 speaker channels.
Verdict	★★★★☆

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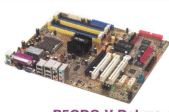
P5AD2 Premium

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Dual Channel DDR2 533
Intel PAT
Triple RAID
Dual Gbit LAN
WiFi-g onboard
1394a/b



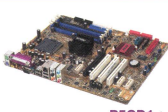
P5GD2 Premium

Intel 915P/ICH6R
Dual Channel DDR2 533
Triple RAID
Dual Gbit LAN
WiFi-g onboard
1394a/b



P5GDC-V Deluxe

Intel 915G/ICH6R
Intel Graphics Media Accelerator 900
Dual Channel DDR2 533 / DDR 400
Triple RAID
1x Gbit LAN
1394a



P5GD1

Intel 915P/ICH6R
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Dual RAID
1 x Gbit LAN
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Mix and match

With music software, you can have everything from a funky drummer to a whole orchestra at your fingertips. *Simon Johnson describes how to mix your own tracks and drop in the perfect samples.*



Bonus CD software

Adobe Audition 1.5
(demo) • ACID XPress 4.0

Skill level

Beginner

Requirements

Windows 2000 or XP
• CD-R drive • DirectX9.

Time to complete

One hour (approx)

Inside info

- Adobe Audition
www.adobe.com/products/audition/main.html
- ACID XPress/Music Studio/Pro
www.newmagic.com.au
- iBreatheMusic
<http://www.ibreathemusic.com>

Audio editing and mixing apps for the PC are a lot of fun, but their user interfaces can be overwhelming. Adobe's Audition 1.5 (\$649, demo included on this month's cover CD set) and Sony's ACID series are good apps to start with. ACID comes in three versions, the free XPress 4.0 (included on this month's cover CD, limited to 10 tracks), the mid-spec Music Studio 5 (see "Special offer", right) and the top-of-the-line Pro 4.0 (\$599). These are very similar, give or take a few features, with the main difference being the number of included samples.

MULTITRACK MIXING

Before you even touch the keyboard, you need to understand some of the basics. Think of the start of your favourite song. It might have vocals, drums and a guitar riff behind it. Now, separate out those sounds in your mind. This is how mixing software utilises the sounds — as individual samples. Put them all together and you have a track.

MULTITRACK VIEW IN ADOBE AUDITION

1 Mixing software represents the song or track by the sum of its parts. In the case of Adobe Audition, the software contains eight tracks or instruments represented by the Multitrack View in the centre of the screen. Here you can see when each instrument starts and finishes in the mix. (Note: Adobe Audition calls the track creation process a session while ACID calls it a project.)

MULTITRACK VIEW IN ACID

2 Both Adobe Audition and ACID come with a

demonstration track. In ACID, click on File, select Hybrid.acid.zip and click the play button in the middle of the screen. In Audition, click on File and select audition-theme.set, then click the play button at the bottom left of the screen. As the song plays, a vertical bar moves through the multitrack view to indicate where you are in the mix.

EDIT THE SAMPLES

3 After the song has finished, click on one of the rectangles corresponding to a particular sample, such as the vocals. In Audition, click on the Edit View tab. Here you will see the waveform for that particular sample. To edit the sample, drag the cursor across the waveform.

4 ACID users can click on the multitrack view and then click on View > Chopper. The sample is then displayed in the lower half of the screen. If you've ever edited a WAV file, you'll feel right at home. You can cut, paste and delete audio, just as you normally would in a WAV editor.

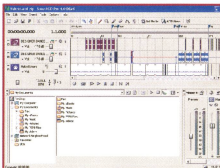
CREATING YOUR OWN MIX

5 In Adobe Audition, click on File > New Session. If you've just played the Audition demo, click Close All first. To create a new track, first choose a few samples. You can do this by clicking on the folder icon under the Files tab. A number of samples are located in C:\Program Files\Adobe\Audition 1.5\Audition Theme. Select Realise-Vocode.cel, repeat the process and select SawBass.cel.

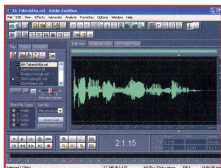
These files are now listed under the tab, which effectively means they're part of the session and you can use them in your track. To use them in the multitrack view, just drag and drop them. For instance, drag the Realise-Vocode.cel into the left hand side of track 1 and SawBass.cel onto track 2. Make any minor adjustments to its position such as moving SawBass.cel to the right so that it starts after Realise-Vocode.cel finishes. Hit play.



1 Getting your session underway in Audition's multitrack view.



2 ACID's multitrack view is where the mixing of tracks begins.



3 Drag the cursor across the waveform to edit a sample in Audition.

4 To add your own samples to the mix using the multitrack viewer in ACID, click on File > New Project. There are a number of ways to add media to a new project. The easiest way is to drag and drop media files from the desktop.

Start Windows Explorer and place a few samples onto the multitrack viewer. For more information about the particular sample, double-click on it to see the track properties. This window shows everything from the sound quality to the actual waveform. You can also drag and drop this window to become part of the user interface.

After manipulating the samples, you need to tell ACID where you want them to come in. This is the easy part: just click on the part of the multitrack viewer you want and drag your mouse across it.

SAMPLE SAMPLES

Before you start sampling, remember that most music is subject to copyright. The good news is that royalty-free sample CDs can be bought from sites such as www.soundsonline.com for between US\$24.95 and US\$100.

The retail versions of ACID come with sample CDs of loops and projects, while the full version of Adobe Audition has more than 5,000 loops in a variety of genres. This may be enough if you're only using the software for home audio/video projects.

MAKING IT SOUND JUST RIGHT

Creating the next killer track isn't about throwing a whole heap of samples together, although there are occasions where even the best placed samples won't sound right.

One reason may be the pitch. Try humming to match the pitch of the sample, then go to the next sample and do the same. You will quickly discover the differences in pitch between each sample and be able to modify them accordingly.

The good news is you can use pitch correction in Audition to make some adjustments. This technique is also known as key mixing and, along

with beat mixing, is used by DJs to help create the effect of one song flowing into another. You can find more information about key mixing at www.i-dj.co.uk.

HELP

There are many ACID Internet communities that offer tutorials, discussion forums, samples and plug-ins. Sites such as www.acidfanatic.com offer a video tutorial (US\$25), so you can get started right away. Unfortunately, you may not find the same resources and online help for Adobe Audition.

WHAT ELSE DO I NEED?

Anyone serious about making music at home needs to decide whether to go totally digital or use a combination of instruments and software. The latter will reduce your PC's consumption of memory and CPU and give your tracks a more authentic sound.

If you decide that fully digital is the way to go, consider running professional, high-end software such as Cubase or Logic Audio. Alternatively, you can start using ACID and, when it's time to upgrade, import your files into Cubase SX3.

If you are using software such as Propellerheads' Reason, you may want to take advantage of the Rewire support in Audition. Rewire allows you to stream audio between the two applications.

Users with a surround sound system should consider purchasing the 5.1 plug-in pack from Sony. For US\$279 you can encode mixes to multichannel Dolby Digital files and burn them to DVD. Audition has a multichannel encoder that enables you to change the mix to support 5.1 surround sound. Of course, the mix can also be exported to other Adobe software, such as Premiere Pro for use in movies.

Before installing the latest mixing software, it's important to have the most up-to-date drivers for your sound card on your system. Updating the drivers will ensure that you experience lower latencies and higher quality output. **OUT**

Special offer

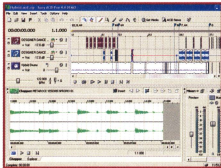
New Magic Australia and Sony Pictures Digital Networks are pleased to offer APC readers the chance to upgrade to the full retail version of ACID Music Studio 5 from ACID XPress 4.0.

Using award-winning ACID software technology, Music Studio has all the tools you need to create your own music, remixes, soundtracks and CDs. Select from over 1,000 music loops in multiple genres, paint them into the tracks and play them back. ACID Music Studio automatically matches the tempo and exclusive "Show Me" tutorials walk you through the entire process step by step.

If you want to make your own music, you can record live vocals and instruments, then combine them with loops. Record and edit MIDI, reverse audio and customise your tracks with powerful studio effects such as EQ, reverb, delay and more. You can even import songs and MP3 files from your own favourite CDs for the ultimate remix.

It will also let you burn continuous mixes, save to popular streaming formats, export music to portable devices and more. Go to www.acidplanet.com and you can join the community and listen, create playlists, remix songs and download free loops.

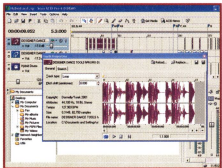
APC readers can upgrade to ACID Music Studio 5 for just \$199, a saving of \$50. Visit www.newmagic.com.au/acidpromo for details.



4 Editing samples with the Chopper in ACID is as simple as cut, drag and paste.



5 A multitrack view in Audition with bass and vocal samples.

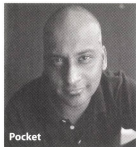


6 Add your own samples to the mix using the multitrack viewer in ACID.

RAGS 2 MIXES

Groove
Terminator

apc competition one



Pocket

Remix new and exclusive tracks from Groove Terminator and Pocket, included on this month's CD set, to be in the running for airplay on fBi radio.

Groove Terminator and Pocket will judge your creations and the winner, plus two runners up, will feature on fBi's lunchtime New Music Show with Dan Zilber.

fBi will also feature your song on its Web site to give you the kind of promotion and exposure that could lead to life in the mixed lane.

Entries close 9 November, 2004.

Winner and runners up to be announced and played on fBi (94.5FM) on 17 December, 2004.

How to enter
Send your remixed track on CD to:
APC Music Competition
GPO Box 4088
Sydney NSW 2000



apc competition two

Get some Zen and \$100 to spend on music

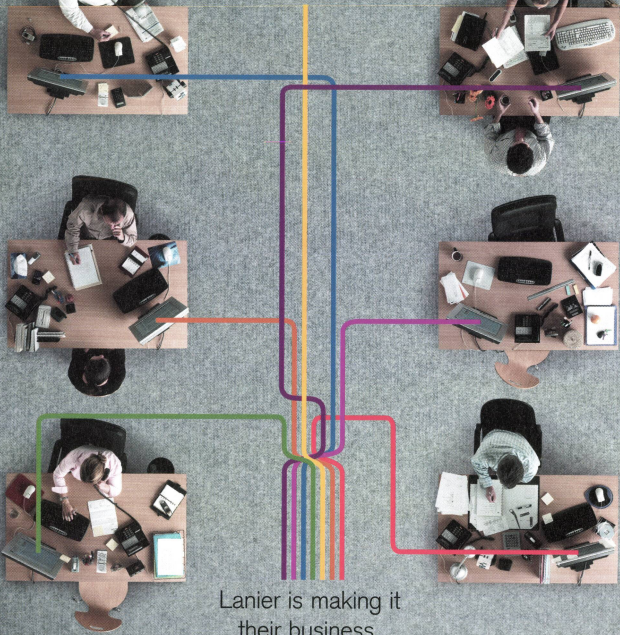
Win one of three Creative Zen 20GB hard drive music players, valued at \$499, plus \$100 to spend at the ninemsn Music store.

Go to <http://music.ninemsn.com.au/compForm.aspx?compId=67> and answer some quick questions to be in the running for a Zen and a hundred bucks' worth of free digital music. Entries close at 5pm on 5 November, 2004 and the winners will be announced on the above Web site on 9 November, 2004. See the Web site for terms and conditions.

music



Document workflow that
actually works?



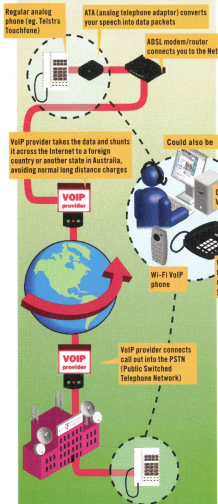
Lanier is making it
their business.

You may not realise it, but up to 90% of business communication is done with paper, even in the internet/email age. When you consider that document expenses account for 15% of operating costs it's vital that your organisation runs its document processes effectively. This is where Lanier's DOCutivity™ Analysis program can help. Our DOCutivity™ team visit you, examine how you use your documents, the speed they're created and how they're utilised. By examining your needs we could find ways to improve your workflow that could save you thousands in document costs and efficiency. If that's the sort of business you'd like to hear more about, call Lanier today on 1300 362 345 for a consultation.

LANIER

Making your documents our business

Why VoIP is cheaper



Why you need VoIP

Upsides

- ▲ Save loads on your monthly phone bill with lower call charges.
- ▲ Make free calls to other VoIP users.
- ▲ Have a phone number for each family member.
- ▲ Customers in different capital cities can call you at a local call cost. You receive the calls free.
- ▲ Friends or family overseas can ring you for the cost of a local call.

Downsides

- ▼ Some VoIP providers don't offer untimed local calls.
- ▼ If your Internet connection goes down, VoIP won't work (though some VoIP hardware will drop back to your regular phone line in this case).
- ▼ 000 emergency services can't tell where you're calling from.

VoIP and save



Bonus CD software

See page 8 for full listing.

Dan Warne explains how to cut your phone bill in half and get free long distance calls with Voice over IP.

Internet telephony has been tagged as the next big thing for about a decade now, but to date it's been a buggy experience plagued by poor sound quality and frustrating limitations.

However, now you don't need to sit at a computer to make calls over the Internet — you can use an ordinary phone connected to a Voice over IP (VoIP) adaptor, or a telephone with VoIP circuitry built-in (IP phone). Both the VoIP adaptor (ATA) and IP phones connect directly to a home broadband router, completely cutting PCs out of the loop.

Sound quality is no longer an issue because broadband is cheap and widely available. Most importantly, there are several new Australian VoIP service providers that can hook you up without the uncertainty of dealing with overseas companies.

ISPs are mounting a full-scale assault on the telephone, with the launch of services allowing consumers to place calls over the Internet, circumventing telcos and regular telephone handsets altogether. Even Telstra is getting in on the action, promising "second home phone line" services using VoIP technology in 2005.

those charged by the big telcos — Telstra's STD rate is 25 cents per minute in peak times, but VoIP provider FreshTel's rate is 6.9 cents per minute.

WHO CAN CALL ME?

While making calls at a fraction of the cost is appealing in itself, why stop at cheap outgoing calls? The latest VoIP services allow you to have a real phone number so anyone can ring you.

Like a normal phone, it's free to receive calls. But unlike a normal telephone, your phone number can be located anywhere in the world. Some providers even let you have multiple numbers attached to one service.

For small business proprietors who can't afford a 1800 number, this is a cheap and convenient way to attract business from across Australia. You could, for example, rent phone numbers in Melbourne, Sydney and Brisbane for a few dollars a month per number, and people in those states would be able to talk to you for the cost of a local call. They don't need to know anything about computers or VoIP to benefit from an immediate reduction in call costs.

If you choose an international VoIP provider, you can get a phone number in any number of countries overseas which will connect through to your VoIP phone or software. For instance, if your sister was living in London, you could join a UK VoIP provider, get a London phone number attached to your service (myWebphone offers them free), and she could call you on that number at local call rates. It wouldn't cost you a cent to receive the call.

When you're shopping around for a VoIP provider, the jargon term for having a real phone number attached to your Internet phone is "direct inward dialling" (DID). The limitation at present is that you can't port your existing home phone number to a VoIP DID provider — you need to get a new one.

GETTING HOOKED UP

There are now at least six Australian VoIP providers offering services directly to consumers, along with countless international companies. One that has

HOW IT WORKS

Until recently, making a phone call meant tying up a circuit between two places for the duration of the call. Those circuits don't come cheap — if it's an international call it ties up satellite time, or a chunk of bandwidth on an undersea fibre optic cable.

On the other hand, Voice over IP slices your voice into Internet protocol data packets, which are routed over the Internet. Only when they reach the destination do they get "connected" to the phone system.

It's very cheap for the VoIP provider to carry your calls this way — the data traffic used is minimal, and they only have to pay negligible "call termination fees" (typically about two cents per minute) in the local city they drop your call into.

The savings are passed on to you, with national call rates typically a fraction of

achieved an astonishing level of success already is Victorian company FreshTel (www.freshstel.com.au), headed by VoIP evangelist Mike Carew.

FreshTel offers a freely downloadable VoIP program called Firefly that feels and works much like MSN Messenger. The easy to use app, fully developed in Australia, has already been adopted by approximately 110,000 people around the world.

The software allows you to call other Firefly users free of charge, ordinary phones anywhere in Australia for 6.9 cents per minute and many overseas destinations for 3.5 cents per minute upwards.

The FreshTel team has also designed a USB handset that works with the software, as well as an IP phone designed to plug straight into a router, which should be available soon.

Popular ISP SwiftBroadband is offering a Voice over IP service to its ADSL and wireless broadband customers. SwiftVoicelP

The wireless phone line

New broadband challenger Unwired (see review, page 44) is deadly serious about taking on Telstra, which controls Australia's copper phone line network.

Far from stopping at challenging ADSL broadband services with its wireless Internet, this upstart wants to cut the cord on your home phone too, with the lure of freeing customers from monthly phone line rentals.

The phone service will be offered using Voice over IP (SIP protocol) via Unwired's wireless broadband Internet protocol network.

But the company's chief technical officer, Eric Hamilton, is at pains to point out that while its phone service will be delivered via VoIP, it will work transparently to the end user as an ordinary phone line.

CEO David Spence says rather than trying to get into a discount war with



Hello: Unwired CEO David Spence tests the wireless phone service. Blue cords are for data

Telstra and Optus, the company aims to "free people from Telstra's landline and its expensive monthly rental fee".

Somewhat Ironically, Unwired reseller SwiftBroadband has beaten the company to the punch in delivering VoIP services over the network with cut-price call rates.

How to slash 60% off your phone bill

We recalculated what a real home phone bill would cost with several VoIP providers. The original bill from Optus came to \$88.10 and included: \$18.82 worth of national; \$23.24 worth of international (all to Canada); \$7.15 worth of mobile; and 19 local and "13 XX XX" calls worth \$4.39. The total call cost amounted to \$53.60. A \$28.50 line rental fee and \$6 voicemail charge brought the bill up to the \$88.10 total.



AFTER!

THE RESULT WAS STUNNING: for the same basket of calls, FreshTel cost \$30.05 — a 45% saving on calls alone, or a 66% saving on the whole Optus bill. Swiftel cost \$27.36 for calls (49% saving), or \$32.86 including monthly fees (63% saving). Engin Networks cost \$21.65 for calls (60% saving), or \$41.60 including monthly fees (53% saving). It's worth noting that "national" calls cost only \$1.40 in total on Engin Networks compared to Optus's \$18.82 because of Engin's untimed 10 cent national calls.

If you're on wireless or cable Internet, you could get rid of your telephone line altogether, saving yourself between \$19 and \$30 per month, depending on the sort of monthly plan you're on with your landline provider.

Provider	Unlimited local call	National per minute	Mobile per minute	Signup	Monthly fee	Real phone number per month
BroadbandPhone www.broadbandphone.com.au	10c (first 50 calls free)	10c	30c	Free	\$15.95	Included
ATP (VoIP) www.austcochpartnerships.com	15.4c	15.4c for 10 mins, then 6.05c	29c	Free	\$8.80	\$2.20
Engin Networks (VoIP) www.engin.com.au	10c	10c untimed to capital cities, otherwise 10c/min	30c	\$149 includes ATA	\$19.95	Included
FreshTel (VoIP) www.freshstel.com.au	ETA November ~ 12c	6.9c	30c	Free	Free	ETA November, price TBA
Nella Networks (VoIP) http://www.nella.net.au	ETA November ~ 15c	5c (30c for 20 mins)	30c	Free	\$9.90	ETA November, included
QZtel (VoIP) http://qztralia.com	N/A	around 30c for 30 mins to capital cities	52.9c	Free	\$1.80	\$1.90
SwiftVoicelP (VoIP) www.swiftbroadband.com.au	15c	6c + 15c flagfall	30c + 15c flagfall	Free, includes IP phone	\$5.50*	Included
Optus (landline telco) www.optus.com.au	15c to 22c**	24c peak**, 11c off peak** + 37c flagfall	37c + 37c flagfall	Free	\$29.95 to \$33.95	Included
Telstra (landline telco) www.telstra.com.au	17.5c to 30c**	26c peak**, 18c off peak** + 35c flagfall	37c** + 35c flagfall	Free	\$18.50 to \$29.90	Included

International rates vary according to destination with all providers. * SwiftVoicelP available only on 12 month contract to SwiftBroadband DSL or wireless customers. ** May vary depending on plan or number being called.

(www.swiftbroadband.com.au/swiftvoiceip/index.htm) has a 12 month contract with a \$5.50 monthly charge, but you get an IP phone thrown in.

Mobile Innovations, once known for its discount mobile phone deals, has quit that part of its business altogether and launched a new VoIP service called Engin Networks (www.engin.com.au). It costs \$19.95 per month to be a member, but its call pricing model is extraordinary — calls to any capital city in Australia are counted as local calls, and it only costs 10 cents to talk for as long as you like.

A list of Australian VoIP providers and their pricing is included in "How to save 60% off your phone bill" (page 101).

MAKING IT WORK

Like everything to do with networking, using VoIP isn't plug-and-play just yet. For example, some routers don't play well with the most popular Voice over IP

protocol (SIP), failing to forward the UDP type data packets used to send the voice traffic to your IP phone or computer.

One method used by VoIP hardware manufacturers to get around this problem is STUN — Simple Traversal of UDP packets through NAT (Network Address Translation). This technology analyses what type of NAT you have and what information needs to be added to the UDP packets for them to enter your firewall and reach your computer or VoIP hardware successfully.

If your VoIP hardware/software uses STUN but VoIP still isn't working, you may need to manually configure the router to forward UDP SIP packets (on port 5060) to the right IP address on your LAN. For Firefly, it's port 4569.

As a last resort, you can use a VoIP provider's "outbound proxy". Outbound proxies work in much the same way as a Web proxy, gathering the data from VoIP callers trying to reach you and forwarding

it through to you, often circumventing router/firewall problems. The downside is that delays may be introduced into the call because data is no longer sent directly between you and the caller.

PICK A CODEC, ANY CODEC

Once you've got the VoIP traffic flowing correctly, picking the appropriate sound coder/decoder (CODEC) for your calls is the key to good sound quality.

Because VoIP sends as much data as it receives, it works most efficiently on ADSL connections of at least 512/128Kbit/s. VoIP is still possible at 256/64Kbit/s but the choice of CODECs is more restricted.

The G.729 CODEC is excellent for all speeds (even 256/64Kbit/s) but isn't supported by all providers, software or hardware. GSM, iLBC and G.726 are other alternatives for all speeds. For 512/128Kbit/s and above, you can also use G.711 and G.722, which provide better sound quality. **BTIC**

What you need: hardware

Using a hardware Voice over IP device can provide robust set-and-forget usability that software just doesn't have yet.

ANALOG TELEPHONE ADAPTOR (ATA):

Plug an ordinary phone into one of these, as well as an Ethernet cord to your router, and it will convert your conversation from sound into a VoIP data stream. Configuration is done through your Web browser. **1** The Grandstream Handytone 286 (from OzVoIP.com, www.ozvoip.com), is well priced at \$149. **2** For \$41 more, the same company offers the Sipura SPA-2000 ATA, which includes two phone ports for two separate services, and even call between the phones as on a PABX.

VOIP ADSL MODEM: all-in-one ADSL modem/router/ATAs can be found for just a little more than a bare analogue telephone attachment. **3** Billion's 7100SV (PC Range, www.pcrange.biz) is a bargain at

\$219, but doesn't include QoS features to ensure voice traffic gets priority over other Net traffic. Network Broadband Services (www.networkbroadband.com.au) have the Draytek Vigor 2600V with QoS for \$459.

IP PHONE: the best way to experience VoIP is with an Internet Protocol phone.

4 The Grandstream Budgetone 102 (\$169, OzVoIP.com) has two Ethernet ports. It also synchronises the onscreen date and time with an Internet time server. For a fully wireless solution, Zyxel's Prestige 2000W is a cordless IP phone that connects using Wi-Fi (\$359 from OzVoIP.com).

USB HANDSET: allows you to use a phone with SIP calling software on your PC. Essentially the handset is just a USB sound I/O device, so it doesn't need drivers. **5** The \$89 Welltech USB Net Phone (Microgram, www.mgram.com.au) also has a keypad, but software

compatibility is limited to the manufacturer's K1000 softphone software. Australian VoIP provider Freshtel also sells an \$89.95 USB handset that integrates with its popular Firefly software (www.freshtel.com.au).

USB HEADSET: **6** Headsets like Logitech's \$79.95 Stereo USB Headset 200 (www.logitech.com) provide an alternative audio input/output that takes over from your PC's built-in sound.

PHONE-TO-PC CONVERTERS: **7** The \$49 ChatCord (OzVoIP.com) allows you to connect your telephone to the microphone and speaker jacks on your soundcard. **8** The \$79 Internet Phone Wizard (OzVoIP.com) is an SIP ATA device that connects to your PC using USB — ideal for people who only have a modem. **9** The Let's Chat Handset is a phone handset with normal soundcard jacks (\$45 from OzVoIP.com).

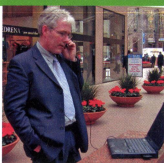


The future of VoIP

WI-FI VOIP MOBILE PHONES: Freshtel CEO Mike Carew is famous for walking around with his laptop in a bag, iBurst wireless broadband connected and a Bluetooth headset on, receiving Firefly calls over the Internet. Carew is convinced mobile phones will soon incorporate Wi-Fi and the ability to roam to VoIP networks when within range of wireless Internet. Nokia has announced that its new top-shelf 9500 Communicator mobile will ship with built-in Wi-Fi, but someone will have to write a Symbian VoIP app.

PDA/SMARTPHONES WITH VOIP: Windows Mobile versions of popular VoIP apps such as X-Ten and SJPhone are already available. The problem is that PDAs aren't designed to be used as phone handsets, with microphone and speaker positioning that aren't ergonomic — look out for revised models in the coming year with better hardware design.

ONE NUMBER FITS ALL: The Internet's domain name system is poised for a shake up, offering individuals worldwide one "eNum". Each will serve as their phone number, VoIP address, email address, Web site URL and more. It's a couple of years off because privacy and political issues are still being worked out (see APC October, page 15), but the technical standards are already in place.



What you need: software



If you want to try VoIP without ploughing hard-earned cash into an IP phone or ATA device, there's plenty of free software

that will let you place calls on your PC.

1 INSTANT MESSENGERS: Yahoo! Messenger for Windows and PhoneGAIM for Linux can make VoIP calls using the SIP protocol. Notably, MSN Messenger can't, but Windows Messenger can.

2 X-TEN X-LITE: X-Ten's softphone is one of the most popular SIP phones. It's free and available for Windows and Mac OS X. There's also a beta version for Pocket PCs with Wi-Fi. Plug-ins for the PC version allow you to use your Outlook contacts with the software's phone directory. The paid version includes PBX functionality.

3 FIREFLY: Australian-developed VoIP program that's free and incredibly easy to use. It's also easy to place calls to normal phones using the Freshtel service, which

comes preconfigured. Currently available for Windows only, though Mac OS X and Linux versions are in the pipeline.

4 SJPHONE: VoIP software that offers support for SIP as well as the older H.323 standard (for talking to people using Microsoft NetMeeting). Available for Windows, Mac OS X, Linux, Windows CE and Pocket PC 2002/2003.

5 LINPHONE: free VoIP software for Linux. Its main claim to fame is a wide variety of CODECs, including the Speex CODEC — uncommon but good for calling on very low bandwidth Internet connections, even 28.8Kbit/s dialup.

6 ASTERISK: comprehensive software PBX for Linux, FreeBSD and Mac OS X. It has an extensive feature set including conference calls, call queuing, voicemail and caller ID. Configuration is complex, but there's an excellent how-to at www.apcmag.com/info/Asterisk.



5
Asterisk

Jargon buster

■ **SIP:** Session Initiation Protocol. A method of setting up voice and video calls over the Internet.

■ **CODEC:** coder/decoder. Software which converts a raw sound and video stream into a compressed format which can be sent over the Internet at an acceptable quality and decoded at the other end.

■ **H.323:** like SIP, but older and less flexible as it requires the use of specific CODECS. Used by Microsoft NetMeeting.

■ **IAX:** InterAsterisk Exchange Protocol. Like SIP, but used with the Asterisk open source VoIP server on Linux. Often works better with home broadband routers.

■ **ATA:** Analog Telephone Adaptor. Plug a normal phone in on one side and connect your ADSL modem/router on the other via Ethernet and it will convert voice into a VoIP data stream.

■ **IP phone:** a phone with built-in ATA.

■ **DID:** Direct Inward Dialling. A local phone number connected to a regular phone network, so people can call you on VoIP with an ordinary phone.

■ **FXO:** foreign exchange office. A phone cord port (for connection to the PSTN).

■ **FXS:** foreign exchange subscriber. A port for connection of an ordinary telephone to a VoIP unit.

■ **PSTN:** Public Switched Telephone Network. Another name for the worldwide phone network.

■ **NAT:** Network Address Translation. Provides Internet connection sharing and allows incoming data to reach the right computer.

■ **UDP:** Internet data packets that are transmitted without waiting for a response from the other end.

■ **STUN:** Simple Traversal of UDP through NAT. Allows VoIP devices to work through NATs by finding out your external IP address and the type of NAT you are using.

■ **QoS:** Quality of Service. Allows your router to give priority to certain types of traffic so they don't get delayed by heavy use of the Internet connection.

Inside info

■ How SIP works
www.apcmag.com/info/SIP

■ Reference guide to all things VoIP
<http://voip-info.org>

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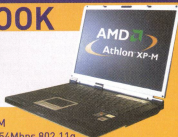
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Satellite pricing plunges to Earth

Locked out of ADSL? As Dan Warne reports, a satellite subsidy could be the answer to your broadband prayers.

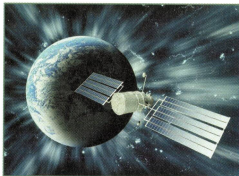
Both Telstra and Optus have significantly reduced stratospheric two-way satellite broadband pricing for people living beyond the coverage of other broadband services.

The price cuts are subsidised through the Federal Government's Higher Bandwidth Incentive Scheme (HiBIS). For customers who qualify for a HiBIS subsidy, a basic 256Kbit/s two-way satellite service will now cost \$69.95 per month for 500MB with BigPond, or \$75 per month with Optus.

Despite the more attractive pricing, satellite services are saddled with serious download restrictions. A 2GB download limit costs almost \$120 with Telstra, while a 3GB plan costs a whopping \$275 per month with Optus satellite.

Satellite dishes get a huge price cut from \$4,000 to \$129 with Telstra, or \$99 with Optus under HiBIS pricing. Both providers require you to take an 18 month contract.

BigPond has also announced reduced prices for Broadband Regional Connect, a service that combines one-way satellite with an ISDN uplink. Users get 256Kbit/s download speed via satellite, 128Kbit/s upload via ISDN and 500MB included. It costs \$89.95 a month, with no separate ISDN data transfer charges.



Is it a bird? Is it a plane? No, it's a pre-election discount!

Satellite Internet access is good for people who mainly want to download big files quickly and don't mind relatively slow response times for Web browsing. Because of the time it takes requests to travel to space and back, response time is an issue, so while one large file can be pumped down from the satellite quickly, it's no good for remote screen sharing, online gaming or anything that requires fast latency.

Customers can check their HiBIS eligibility with BigPond at www.bigpond.com/hibis or with Optus at www.optus.com.au/hibis.

Netcomm adds wireless

Netcomm has updated its popular NB1300Plus4 router to include wireless. The \$244 device includes an ADSL modem, four port 10/100 network switch and 802.11b Wi-Fi access point. The real-life wireless speed of 11Mbit/s is ample for sharing a broadband connection around the home. But if you want file transfers between PCs on a network at a decent speed, spend an extra \$85 for the 802.11g wireless NB5580W, which operates at a theoretical 54Mbit/s (realistically, about 22Mbit/s).

Pump up the dial-up

For readers who can't access broadband, OnSpeed (www.onspeed.com) is a UK-based service that can enhance the speed of a dial-up connection substantially using data compression. For about \$5 per month, dial-up users gain access to the OnSpeed Internet proxy, which heavily compresses data on-the-fly. At your PC, the OnSpeed software transparently decompresses it. The effect can be dramatic for Web pages with lots of text, such as online forums. Unfortunately, it doesn't help for pre-compressed data like MP3 music, streaming video or program downloads.

Your monthly guide to the best deals

APC is proud to partner with the independent broadband monitoring service Broadband Choice (<http://broadbandchoice.com.au>) to bring you the best broadband deals every month.

The comparison table on the following page focuses on ISPs that best serve the majority of APC readers' needs. These include coverage in Melbourne, Brisbane and Sydney; 1300, 13 or 1800 telephone support; contracts of 12 months or less; and five or more email addresses.

We've excluded ISPs that meter both uploads and downloads and only listed those that meet at least three of our four plan selection criteria:

- Budget plan: cheapest deal under \$30.
- Light plan: cheapest deal under \$65, with at least 512Kbit/s speed and 1GB data.
- Family plan: largest download allowance under \$90, at least 512Kbit/s and 5GB data.
- High speed: cheapest 1.5Mbit/s plan under \$160, with 4GB data minimum.

If an ISP has "unlimited downloads" but speed is throttled after reaching a certain limit, the portion in which you can get full-speed downloads is listed as their limit.

We've picked the lowest price for a contract period of six months or less for broadband installation. Otherwise, the lowest price option was selected. The installation price doesn't include a modem because you'll generally get better value buying a modem separately. See www.apcmag.com/web/_0/Get Routed! for advice on choosing a modem/router.

Can't find your provider in our list? That's because some of the largest ISPs, and many smaller ones, didn't meet our selection criteria. ISPs enter their own information into the Broadband Choice database. ISPs can contact bc@whirlpool.net.au for more details.

Data was extracted from the Broadband Choice database on 12 August 2004.

BROADBAND DIRECTORY

Name	Phone	Online	Budget plan (under \$30)	Light plan (under \$65, minimum 1GB data limit, at least 512Kbit/s)	Family plan (under \$90, minimum 5GB data limit, at least 512Kbit/s)	High-speed plan (under \$160, minimum 4GB data limit, at least 1.5Mbit/s)
AAPT smartchat	13 88 88	www.aapt.com.au	\$29.95* 200MB 256Kbit/s	N/A	\$69.95† 12GB 512Kbit/s	\$99.95† 12GB 1.5Mbit/s
Alphalink	1300 360 638	http://home.alphalink.com.au	\$29.70* 200MB 256Kbit/s	N/A	\$89 30 GB 512Kbit/s	\$114.90 10GB 1.5Mbit/s
Australia Internet Solutions	1300 887 877	www.ains.com.au	\$24.95* 200MB 256Kbit/s	\$59.95* 5GB 512Kbit/s	\$84.95 No limit 512Kbit/s	\$139.95* 5GB 1.5Mbit/s
Australis Internet	1800 288 871	www.australis.net	\$29.95* 200MB 256Kbit/s	N/A	\$79.95 25GB 512Kbit/s	\$129.95 35GB 1.5Mbit/s
Big Blue	1300 791 789	www.bigblue.net.au	\$24.95* 200MB 256Kbit/s	\$49.95* 4GB 512Kbit/s	\$69.95* 20GB 512Kbit/s	\$79.95* 5GB 1.5Mbit/s
Bizmail Broadband	1300 797 774	www.bizmail.com.au	\$29* 250 MB 256Kbit/s	\$49* 4GB 512Kbit/s	\$77 No limit 512Kbit/s	\$89* 16GB 1.5Mbit/s
Bullet Internet	1300 137 454	www.bullet.net.au	N/A	\$59.95* 3GB+ 512Kbit/s	\$69.95* 10GB+ 512Kbit/s	\$129.95* 10GB+ 1.5Mbit/s
Comcen Internet	1300 300 324	www.comcen.com.au	\$22.95* 200MB+ 256Kbit/s	\$59.95 15GB 512Kbit/s	\$79.99 No limit 512Kbit/s	\$89.95 15GB 1.5Mbit/s
DART Internet	1300 305 113	www.dart.net.au	\$26.95* 200MB 256Kbit/s	\$55 4GB 512Kbit/s	\$90 24GB 512Kbit/s	\$95 4GB 1.5Mbit/s
DataCo	1300 680 692	www.dataco.com.au	\$25* 1GB 256Kbit/s	\$48* 6GB 512Kbit/s	\$69* 18GB 512Kbit/s	\$89* 15GB 1.5Mbit/s
Dinkum Internet	1300 663 400	www.dinkum.net.au	\$29.95* 200MB 256Kbit/s	N/A	\$79.95 No limit 512Kbit/s	\$119.95 No limit 1.5Mbit/s
E-Access	1300 138 810	www.e-access.com.au	N/A	\$59.95* 1.2GB 512Kbit/s	\$79.95 12GB 512Kbit/s	\$109.95* 6GB 1.5Mbit/s
E-SOUL	1300 367 258	www.e-soul.net	N/A	\$49* 1GB+ 512Kbit/s	\$78.80 No limit 512Kbit/s	\$89* 8GB+ 1.5Mbit/s
E.Tel Communications	1800 733 888	www.e-tel.com.au	N/A	\$54.95* 5GB 512Kbit/s	\$76.95 No limit 512Kbit/s	\$89.95* 10GB 1.5Mbit/s
Gday.net	1300 722 231	www.gday.net	\$29.95* 200MB 256Kbit/s	\$64.95* 1.5GB 512Kbit/s	\$89.95 No limit 512Kbit/s	N/A
Global Dial	1300 130 710	www.globaldial.net	N/A	\$59.95 4GB+ 512Kbit/s	\$79.95 16GB+ 512Kbit/s	\$89.95 5GB+ 1.5Mbit/s
GoTalk	1800 468 255	www.gotalk.com.au	\$19.95* 200MB 256Kbit/s	N/A	\$89.95† No limit 512Kbit/s	\$129.95† 15GB 1.5Mbit/s
Hypermax	1800 625 297	www.hypermax.net.au	\$19.95* 200MB 256Kbit/s	N/A	\$79.95 No limit 512Kbit/s	\$129.95 No limit 1.5Mbit/s
IDXNet	1800 617 292	http://idx.com.au	\$29.95* 200MB 256Kbit/s	\$59.50* 8GB 512Kbit/s	\$79.50 No limit 512Kbit/s	\$110* 20GB 1.5Mbit/s
iNet	13 19 17	www.inet.net.au	\$24.95† 200MB 256Kbit/s	\$59.95 12GB+ 512Kbit/s	\$79.95 No limit 512Kbit/s	\$89.95 12GB+ 1.5Mbit/s
Internode	1300 788 233	http://adsl.internode.on.net	\$29.95* 300MB 256Kbit/s	\$59.95 12GB 512Kbit/s	\$79.95 32GB 512Kbit/s	\$89.95 12GB 1.5Mbit/s
Interworks	1300 720 207	www.interworks.net.au	\$29.95* 200MB 256Kbit/s	N/A	\$84.95 25GB 512Kbit/s	\$119.95 35GB 1.5Mbit/s
iPrimus	1300 851 185	www.iprimus.com.au	\$29.95* 300MB 256Kbit/s	\$49.95 2GB 512Kbit/s	\$69.95 12GB 512Kbit/s	\$119.95 12GB 1.5Mbit/s
KeyPoint	1300 550 550	www.keypoint.com.au	N/A	\$59.95* 4GB 512Kbit/s	\$89.95 No limit 512Kbit/s	\$99.95* 10GB 1.5Mbit/s
Nella Networks	1300 884 638	www.nella.net.au	\$29.95* 200MB 256Kbit/s	N/A	\$69.95 No limit 512Kbit/s	\$148.95 20GB+ 1.5Mbit/s
Netspace	1300 360 025	www.netspace.net.au	\$29.95* 300MB 256Kbit/s	\$49.95 3GB+ 512Kbit/s	\$89.95 25GB+ 512Kbit/s	\$79.95 4GB+ 1.5Mbit/s
Optaweb	1300 730 720	www.optaweb.com.au	\$21.95* 200MB 256Kbit/s	N/A	\$79.95 No limit 512Kbit/s	\$129 10GB 1.5Mbit/s
OptusNet Cable	1800 504 504	http://broadbandsales.optusnet.com.au	\$29.95† 200MB 10Mbit/s	\$49.95† 1GB 10Mbit/s	\$64.95† 12GB 10Mbit/s	\$64.95† 12GB 10Mbit/s
OptusNet ADSL	1800 504 504	http://broadbandsales.optusnet.com.au	\$29.95† 200MB 256Kbit/s	\$49.95† 1GB 512Kbit/s	\$69.95† 12GB 512Kbit/s	\$118.95† 12GB 1.5Mbit/s
OEEmail Broadband	13 35 93	http://homelite.service.ozeemail.com.au	\$29.95 300MB 256Kbit/s	\$64.95 12GB 512Kbit/s	\$64.95 12GB 512Kbit/s	\$99.95 12GB 1.5Mbit/s
Pacific Internet	13 36 35	www.pacific.net.au	N/A	\$54.95 No limit 512Kbit/s	\$54.95 No limit 512Kbit/s	\$149* 22GB 1.5Mbit/s
Primus-ADL	1800 265 777	www.primusonline.com.au	\$29.95* 300MB 256Kbit/s	\$49.95 2 GB 512Kbit/s	\$69.95 12GB 512Kbit/s	\$119.95 12GB 1.5Mbit/s
Spin Internet	1300 933 375	www.spin.net.au	\$22.95* 200MB+ 256Kbit/s	\$59.95 15GB 512Kbit/s	\$79.99 No limit 512Kbit/s	\$89.95 15GB 1.5Mbit/s
SwiftBroadband	1300 360 197	www.swiftsds.com.au	\$28.95* 200MB+ 256Kbit/s	\$40* 1GB 512Kbit/s	\$55* 16GB 512Kbit/s	\$85* 16GB 1.5Mbit/s
Tel.Pacific	1300 369 888	www.telapacific.com.au	N/A	\$49.95* 2 GB 512Kbit/s	\$79.95 No limit 512Kbit/s	\$119.95* 15GB 1.5Mbit/s
TPG Internet	1300 360 855	www.tpg.com.au	\$19.95* 200MB 256Kbit/s	N/A	\$79.95 No limit 512Kbit/s	\$149.95 No limit 1.5Mbit/s
Veritel Australia	1300 669 869	www.veritel.com.au	\$27.95* 200MB 256Kbit/s	\$64.95* 1.5GB 512Kbit/s	\$89.95 No limit 512Kbit/s	N/A
Web Ace	1800 202 012	www.webace.com.au	\$28.95* 200MB 256Kbit/s	N/A	\$82.95 No limit 512Kbit/s	\$159.95 25GB 1.5Mbit/s
WestNet	1300 555 160	www.westnet.com.au	\$29.95* 200MB 256Kbit/s	\$59.95 4GB+ 512Kbit/s	\$79.95 16GB+ 512Kbit/s	\$89.95 5GB+ 1.5Mbit/s

Key: * ISP charges excess usage fees when you exceed your download limit; † This price only available if bundled with long distance telephony from the ISP;
+ Additional download allowance available with this plan for use in off-peak periods.

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✓	5	✓	\$121 1 mth	✓
✗	5	✓	\$125 6 mths	✓
✗	25	✓	\$149 6 mths	✓
✓	5	✗	\$159.95 6 mths	✓
✗	10	✓	\$129 6 mths	✓
✗	5	✓	\$150 6 mths	✓
✓	5	✓	\$99 6 mths	✓
✓	5	✗	\$143 1 mth	✓
✗	10	✗	\$139 3 mths	✓
✓	5	✗	\$129 6 mths	✓
✓	5	✗	\$139 6 mths	✓
✓	5	✓	\$99 6 mths	✓
✓	10	✓	\$148 6 mths	✓
✓	5	✗	\$159 6 mths	✗
✓	10	✓	\$99 6 mths	✓
✓	5	✗	\$149 6 mths	✗
✓	5	✓	\$149.95 1 mth	✓
✗	5	✓	\$110 6 mths	✓
✓	5	✓	\$89 6 mths	✓
✓	5	✓	\$129 1 mth	✓
✓	5	✓	\$140 3 mths	✓
✓	5	\$4/mth	\$99 12 mths	✗
✗	5	✓	\$99 6 mths	✓
✓	5	✓	\$0 6 mths	✓
✓	10	✓	\$129 6 mths	✓
✗	10	✗	\$129 6 mths	✓
✗	5	✓	\$59 12 mths	✗
✗	5	✓	\$59 12 mths	✗
✓	15	✗	\$99 3 mths	✗
✓	5	✓	\$99 6 mths	✓
✓	7	✗	\$149 3 mths	✗
✓	5	✓	\$99 6 mths	✓
✗	10	✗	\$129 6 mths	✓
✗	5	✓	\$149 3 mths	✓
✗	20	✓	\$129 12 mths	✓
✓	5	✓	\$125 12 mths	✓
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DVD-RW
Windows XP Home Edition



G736
Intel® Pentium® 4 Processor 3.0GHz
128MB ATI Mobility Radeon 9600 graphic
256/512/1024 MB DDR SDRAM
15" TFT SXGA 1400x1050 display
30/40/60/80 GB HDD
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D490
Intel® Pentium® 4 Processor 3.2GHz
128MB ATI Mobility Radeon 9600 graphic
256/512/1024 MB DDR memory
30/30/60/80 GB HDD
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WORKSHOP

Hands-on with hardware and software, plus bonus CD content



Bonus CD software

Most Workshop articles are accompanied by bonus software loaded onto our cover CD. Just look for this icon — the software it identifies is often integral to the article. The selection ranges from full-working versions and trial versions to shareware and freeware.

APC cannot provide tech support for these programs but if you have a problem with the CD itself, by all means holler our way (see page 8 for details on how to contact our CD team).

Site of the month



www.sodaplay.com

Why play when you can sodaplay? The Soda Constructor is a simple Java simulator that allows you to virtually play God by building models and seeing how they behave under a range of environments.

Each model is made up of a system of masses, springs and muscles. Slide controls give you the ability to change the gravity, friction of masses, spring stiffness and muscle power, all of which affect the way a model behaves.

The predefined models are usually enough to get you started, but the real fun comes when trying to make your own. Most people try to make models that walk across the screen, but the sky's the limit. If you're proud of one of your creations, you can save it in the Soda Zoo, allowing others to see it.

If you're more competitive than creative, you can pit your model in the Soda Race — an online competition that encourages you to race your model against others over a randomly generated two-dimensional terrain.

Mix up



Workshop has always been one of the core sections of APC. Whether you're a power user who wants to get things done more efficiently or a newbie wanting to learn how to do something interesting with your box, there's usually something in this section designed to appeal to you.

Getting this balance right is difficult. In fact, putting together ideas for Workshop is a lot like compiling a menu at a restaurant — if you don't have variety, what's on offer won't appeal to anyone. Too many simplistic tutorials leave power users unchallenged, while too much small business content leaves home users high and dry. And then there's the Linux users to satisfy as well!

For the last few months, I've been developing a formula in an attempt to get this balance just right every month. This formula is constantly evolving to suit changes in the audience, season and the IT industry.

Moving forward, we'll be including a lot more multimedia content in our articles. Some Workshops will feature video presentations or image galleries. We're also looking to include more resources on the cover CD set. For example, the sample artwork used in the "Custom cool" Workshop (page 110) is included on the cover CD set. Using this in conjunction with the Samurize application (also on the CD) and the Workshop, you should be able to achieve similar results.

Workshop is about delivering relevant and interesting tutorials for all readers. Naturally, because the skill level of our readers differs, it's generally not possible to ensure that everything applies to everyone. But if you think that there are topics we haven't covered in enough detail in Workshop, drop us an email (workshop@apcmag.com) and let us know how we can improve.

Jarrod Spiga
Workshop Editor

110 Windows XP Serious Samurize

Tired of looking at the same old desktop icons? James Bannan demonstrates how Serious Samurize can revolutionise your computing lifestyle.

112 Linux Email server, part 2

Anton Tomazin and Caroline Leming show you some simple ways to clear email containing viruses and spam.

118 Administration Messaging

Mathew Dickerson looks at how to manage faxing, voicemail, SMS and unified messaging with your PC.

120 Internet Apache Web Server, part 5

If Apache keels over for some reason, it's easy to solve the problem once you've found the cause. Jarrod Spiga explains where to look and what to do when things go wrong.

All code fragments and examples given in Workshop articles are for demonstrative purposes only. Questions or comments? Email workshop@apcmag.com.

Custom cool

Tired of looking at the same old desktop icons? **James Bannan** demonstrates how **Serious Samurize** can revolutionise your computing lifestyle.

Windows XP has been around for over three years, and the My Computer, Recycle Bin and other icons are looking pretty tired. Even skins and themes can't take away the monotony of a standard Windows desktop.

This is where Serious Samurize comes in. This free application lets you create scripts and applets which run on your desktop and interact with various aspects of your computer. You can use it to keep an eye on your free disk space or CPU utilisation, or to feed news headlines to your desktop without the overhead of Active Desktop. It's also great for desktop modders and benchmarkers — just create multiple configurations and use whichever one you need.

WATCH THIS SPACE

1 The first step is to install Samurize from this month's cover CD set. In the Application menu, select the Config Tool. This loads the Design Area, where layouts, applets and meters are created. The grey, gridded space is where the actual layouts are done, and the Tools and Settings area on the right is where the various theme elements are configured. The Design Area automatically aligns itself with your current desktop resolution.

Under Tools and Settings, click on Add Meter > Add Drive Space to add a basic, unlinked meter to the Design Area. With the meter selected, change the Draw Type on the General tab to Progress Bar. Tick Enable Alert Value, and set it to warn you when the value is under 10.

Now, select a drive that you'd like to monitor from the Source tab. Leave the Return Value as Free Space and change the unit from Megabytes to %.

Go to the Display tab. Check the Reverse box, then the Background box and choose a colour to contrast with the progress bar. If you have trouble seeing the bar, raise the alpha value. Then use the Test Value slide to see the meter in action. As you slide the meter towards 0 (no free space), the meter colour recedes. When it hits the alert value (specified earlier), it changes to the alert colour.

To make this meter more visually interactive, move the meter you've just created to a corner of the Design Area, click the Add Meter button and create another Add Drive Space meter. The default Draw Type is text — leave it at that, and go to the Source tab.

2 Select the same hard drive you chose in the first meter, and change the unit to %. Go to the Display tab, and in the text box change the text to read "Free: %v%" and the number of decimals to 2. Change horizontal and vertical alignments to centre and middle respectively. Then drag the newly-created text meter over the top of the progress bar meter — you now have a stylish graphical meter with a numerical read-out.

You can experiment with the text part to make it read megabytes (or gigabytes) instead of a percentage, or change the font to make it stand out more (bottom of the Display tab).

Save your configuration in the C:\Program Files\Serious Samurize\Configs directory — that's where Samurize looks for created configs.

TRAFFIC POLICE

Create a new meter and select Add PerfMon. The default computer is the UNC NetBIOS name of your computer, but you can change it to Use local computer counters. Select the Bytes received/sec counter, change the performance object to



Bonus CD software

Samurize 1.55 • Meter artwork files.

Skill level

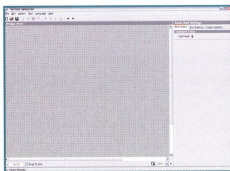
Intermediate

Requirements

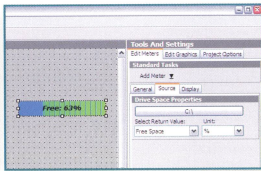
Windows XP • Samurize

Time to complete

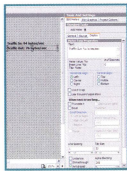
2 hours (approx)



1 Start with a blank slate, then add a few elements to get your creative juices flowing.



2 Overlaying text and graphical elements is one way to get an informative yet aesthetic solution.



3 Track your network transfers from the desktop.

Spam and virus protection

Your mail server is installed and configured, so what's next?

Anton Tomazin and Caroline Leming illustrate some simple ways to identify and eliminate emails containing viruses and spam.

In this series . . .

Part 1 — October
Setting up POP and SMTP servers

Part 2 — November
Spam and virus protection

Part 3 — December
Web mail



Bonus CD software

Clam AntiVirus 0.75 •
SpamAssassin 2.64 •
SpamAssassin milter
plug-in 0.2.0.

Skill level

Intermediate

Requirements

Linux • Internet
connection • domain
name and DNS • Sendmail
• GNU m4 and POP3/IMAP
server software • ClamAV •
SpamAssassin • Spam
Assassin milter plug-in.

Time to complete

1 hour (approx)

Inside info

- Clam AntiVirus:
www.clamav.net
- SpamAssassin
<http://spamassassin.apache.org>
- SpamAssassin Milter plug-in
<http://savannah.nongnu.org/projects/spamass-milt>

In part one of this series ("Setting up POP and SMTP servers", APC October, page 110), a Linux mail server was set up with Sendmail. Now that it's up and running, it's time to protect yourself from viruses and spam by installing and configuring Clam AntiVirus and SpamAssassin. By the time you're finished, every email processed by your server will be scanned and checked for viruses and flagged as spam if appropriate.

VIRUS PROTECTION FOR YOUR MAIL SERVER

There are a few steps you can take to decrease the risk of virus attack on a mail server. It's essential to have up-to-date antivirus software installed on any client you intend to connect to your email server. If the mail server fails to detect and isolate a virus, the client machine should pick it up. It also stops clients from sending a virus to the mail server via their outgoing mail.

It's a good idea to have as many layers of protection against viruses as possible. That way, if infected email gets past the first layer of detection, consecutive layers should detect and isolate it before any major damage is done.

Obviously, you can't control virus checking on the systems of everyone who sends you mail, but protecting the systems of known clients can significantly reduce the number of viruses your AV software has to handle.

INSTALLING CLAMAV

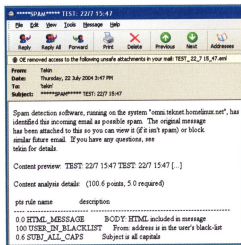
Clam AntiVirus is free and downloadable from <http://prdownloads.sourceforge.net/clamav> and this month's cover CD set. ClamAV integrates with your mail server and targets attachments when scanning for viruses.

The package includes automatic updates, a command line scanner and a flexible, scalable multi-threaded daemon.

On installing ClamAV for the first time, add a new user and group:

```
groupadd clamav
useradd -g clamav -s /bin/false -c
'Clam AntiVirus' clamav
```

Next, extract the archive and compile the source:



Gotcha: SpamAssassin uses a points system to identify junk email. If a message gets a high score, it's probably spam.

```
tar -zxvf clamav-0.75.tar.gz
cd clamav-0.75/
./configure --sysconfdir=/etc --
enable-milter
make
make install
```

The source sets up the package for your system, compiles it and installs the programs and any data files and documentation.

SETTING UP VIRUS SCANNING

ClamAV and Sendmail must be configured to run an antivirus scan on each email. You also need to set it to regularly update virus definitions.

Sendmail uses a mail filter (milter) in order to pass the mail to ClamAV for checking. The milter is included in the ClamAV package.

Firstly, Sendmail configuration must be updated. To do this, include the following line in the `sendmail.mc` file:

```
INPUT_MAIL_FILTER('clmilter','S=local:
/var/run/clmilter.sock,F=, T=5m;R=
4m')dnl
```

Then, regenerate the `sendmail.cf` file:

```
cd <path.to.sendmail.src>/cf/cf/
sh Build sendmail.cf
sh Build install.cf
```

1 Update the `/etc/clamav.conf` file. This file is well-commented and more information can be

found by reading the clamav.conf man pages (type `man clamav.conf`). The first thing to change in this file is to comment (#) or remove the following line:

Example

Uncomment the following lines:

```
LogFile /tmp/clamd.log
ScanMail
StreamSaveToDisk
```

The first line is important — the resulting log file can be useful for troubleshooting. Next, add the following line to the configuration so the ClamAV-milter feature will function correctly:

```
LocalSocket /var/run/clamav/clamd.sock
```

Save your changes and then create the `/var/run/clamav` directory and assign it appropriate permissions:

```
mkdir /var/run/clamav
chown clamav /var/run/clamav
chmod 700 /var/run/clamav
```

To start ClamAV and the ClamAV-milter, run the following commands:

```
clamd
/usr/local/sbin/clamav-milter -lo
/var/run/clamav/clamilter.sock

Restart Sendmail
```

UPDATING CLAMAV

2 To make sure that the virus database is up-to-date, ClamAV uses “FreshClam”. This is configured in the `/etc/freshclam.conf` file. Create a log file `/var/log/freshclam.log`. Make sure the

file is owned by the ClamAV user and that the user has both read and write privileges.

```
touch /var/log/freshclam.log
chown clamav /var/log/freshclam.log
chmod 600 /var/log/freshclam.log
```

To check that the virus database is updating correctly, uncomment the following line in the `/etc/freshclam.conf` file:

```
UpdateLogFile /var/log/freshclam.log
```

To set how often FreshClam updates the virus definitions, edit the following line in `/etc/freshclam.conf`:

```
Checks 12
```

In this case, FreshClam will check for a new definitions 12 times a day, or every two hours. It can be run interactively using the `freshclam` command, or as a daemon by appending the `-d` switch to the `freshclam` command.

To test ClamAV, recursively scan the source directory and save the results in a file called `scan.txt`. Some test viruses are included in the source directory, and the resulting `scan.txt` file should look like this:

```
clamscan -r -l scan.txt
<path.to.clamav.src>
```

All mail sent and received through the mail server will be scanned for viruses, and the virus database updated automatically.

SPAMASSASSIN

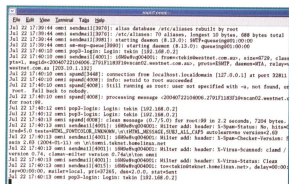
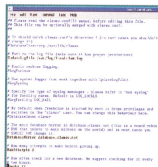
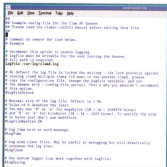
SpamAssassin is a spam identification tool which works by running a range of tests on the headers and body text of email. It then assigns a score

Spam blacklists

System administrators fed up with having their servers abused by spammers are fighting back. The Open Relay DataBase (<http://ordb.org>) and The Spamhaus Project (www.spamhaus.org) have blacklists of hosts known to handle spam.

For instance, the Sendmail server can be set to query the ORDB blacklist any time mail is received from a host whose status you're not sure of.

While undoubtedly effective, these types of services should be used with caution as they intentionally limit the server's connectivity, and they aren't 100% effective. If you aren't willing to sacrifice an occasional legitimate email, avoid using these lists.



1 ClamAV Log Files: FreshClam busy logging updates to the virus database.

2 Daemons running: ClamAV and SpamAssassin processes in progress.

3 /var/log/messages: Spam and virus-check headers being added to an email.

► to each message on the likelihood that it's spam. SpamAssassin checks things such as the validity of sender and recipient addresses, send dates and the presence of "forbidden" words in the email body or subject line.

It also checks the message against user-defined blacklists and whitelists, with messages from addresses on the blacklist flagged as spam without further analysis. Emails from addresses on the whitelist go directly to your inbox.

Each test run contributes to the final "spam score" for the message. The user defines their preferred "spam threshold". Any mail item scoring above this value is considered spam and flagged with a special spam header.

SpamAssassin also permits users to decide whether they want mail that is flagged as spam to be deleted or sequestered in a particular folder for review. You can also change the scoring rules or add your own Spam tests to personalise SpamAssassin to your needs. The program also works on a Bayesian algorithm, enabling it to learn from past conclusions.

Other benefits of SpamAssassin are: it requires very little configuration; it doesn't need constant updating; and it can be set to run a daemon in memory, continuously scanning all messages or each time a message is received.

First, download SpamAssassin from <http://spamassassin.apache.org> or from this month's cover CD set. To install the application, first extract the file and compile it:

```
tar -zxvf Mail-SpamAssassin-2.64.tar.gz
cd Mail-SpamAssassin-2.64/
perl Makefile.PL
make
make install
```

The install file in the Mail-SpamAssassin-2.64.tar.gz archive has full descriptions, download locations and installation instructions for each optional module (such as DB_File, Razor, Pyzor and DCC).

As with ClamAV, SpamAssassin requires a milter to be incorporated into the Sendmail configuration.

Obtain the SpamAssassin Milter from the cover CD set, or from <http://savannah.nongnu.org/projects/spamass-milt>, then enter:

```
tar -zxvf spamass-milter-0.2.0.tar.gz
cd spamass-milter-0.2.0/
./configure
make
make install
```

CONFIGURING SPAMASSASSIN

SpamAssassin's configuration file contains many directives. To view the documentation detailing all directives for the `/etc/mail/spamassassin/local.cf` file, type:

```
perldoc Mail::SpamAssassin::Conf
```

The `required_hits` directive is the most important. It reflects the score required for SpamAssassin to consider a message as spam. For a complete rundown of the tests and how each is scored, visit <http://spamassassin.apache.org/tests.html>.

If you still receive an abundance of spam, it might be that they only hit one of the rules set in your configuration and aren't detected as spam. To allow SpamAssassin to correctly classify these messages as spam, change the score from the default value by modifying the appropriate line in `/etc/mail/spamassassin/local.cf`:

```
score <test_name> <points>
```

where `<test_name>` is the name of the test being run on the message and `<points>` is the amount you'd like added to the score of each message that satisfies the test. A test can be disabled by changing the points value to 0.

Next, Sendmail should be configured to run each message it receives through SpamAssassin. To do this, add the following lines to `sendmail.mc`:

```
INPUT_MAIL_FILTER ('spamassassin',
'S=local:/var/run/sendmail/
spamass.sock, F=. T=C:15m;S:4m;R:
4m;E:10m')dnl
define('confWILTER_MACROS_
CONNECT', 'b, j, _, {daemon_name},
{if_name}, {if_addr}')dnl
```

Regenerate the `sendmail.cf` file as described above. SpamAssassin must be started as a daemon before Sendmail will scan for spam:

```
spamd -d
```

Start the spamass-milter by typing:

```
spamass-milter -p /var/run/
spamass.sock -f
```

Alternatively, to send blocked mail to a particular mailbox, add the option when starting the spamass-milter:

```
spamass-milter -p /var/
run/spamass.sock -f -b
spammydomain.com
```

To specify trusted email addresses or flag all mail from known spammers, use the whitelist and blacklist options. These options are set in the SpamAssassin configuration file `/etc/mail/spamassassin/local.cf`. For example:

```
whitelist_from *@mydomain.com
blacklist_from user2@someotherdomain.com
all_spam_to user3@mydomain.com
```

In this example, all email messages from `mydomain.com` will not be flagged as spam. All email from `user2@someotherdomain.com` will be marked as spam.

Mail addressed to `user3@mydomain.com` won't be filtered, as `all_spam_to` allows all mail, including spam, to be sent to this address.

■ You should now have a working Sendmail server that's protected from viruses and spam. [\[11\]](#)

SpamAssassin modules

Collaborative spam-tracking databases are available for use with SpamAssassin, including Vipul's Razor, Pyzor and DCC. They work by taking a signature of spam messages.

Because spam usually involves sending the same email message to multiple recipients, the database allows the first person on the spam address list to receive the spam and add it to the database. From this point, everyone else in the address fields of the spam email will automatically block the message.

Full descriptions, download locations and installation instructions for these spam-tracking databases can be found in the install file in the Mail-SpamAssassin-2.64.tar.gz archive.



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Other Equipment



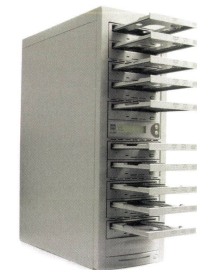
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FILMS & SPRAY: Accent laminator film / Clear Gloss 400ml spray / Disc Cleaner

Capax Technology Pty Ltd

Just the fax

Getting the message across to your colleagues doesn't need to be complicated. *Mathew Dickerson* looks at how to manage faxing, voicemail, SMS and unified messaging with your PC.

Skill level

Intermediate

Requirements

Windows Server 2003 CD
• Class 1 fax modem device with latest drivers
• analogue phone line to plug into the modem.

Time to complete

1 hour (approx)

Inside info

- RVS-Com Plus
www.rvscom.com
- WinFax Pro
www.symantec.com/winfax
- Zetafax
www.zetafax.com
- HylaFAX
www.hylafax.org
- OzeFax
www.ozefax.com.au

The problem with small business communication is there are so many methods available. Do you send an email, fax, SMS, MMS, IM, voicemail or just pick up the phone and ring someone? Luckily, there are numerous software solutions designed to make these decisions easier.

One thing that's become obvious is the degree to which businesses are still reliant on fax. Even though email surpasses faxing in terms of quantity, surveys indicate that business productivity would be reduced dramatically if faxing was removed from their communication arsenal.

WINDOWS SERVER 2003 FAXING

Recognising the importance of fax communication, Microsoft has incorporated a comprehensive network faxing program into Windows Server 2003 (except for the Web Edition).

To set up Windows Server 2003 to send and receive faxes, follow these steps:

- Install the fax service by going to Start Menu > Control Panel > Add/Remove Programs > Windows Components.
- Check Fax Services and select Next.
- Select Share the fax printer. This automatically shares the fax printer when a modem is installed on the server.
- Install an appropriate fax modem on the server. The modem needs to be a Class 1 fax modem, but most new modems are fax-compatible with Windows Server 2003.
- To configure the fax service, select Start Menu > All Programs > Accessories > Communications > Fax > Fax Manager.

■ Right-click on Fax (Local), select Properties and the Recipients tab.

■ Select Enable SMTP email receipts delivery and Use these SMTP settings for the Route Through Email incoming routing method. Put a valid reply address in the From email address field, and enter your internal mail server name or IP address (or your ISP's mail server if you don't have an internal mail server) in the Server address field.

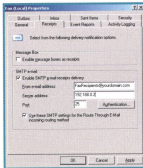
■ Select the Sent Items tab and set an appropriate drive and folder path to store all faxes sent from client desktops. If users on the network require access to these sent faxes, this location can be on a drive on the server that is accessible via the network or can be shared out directly. Change the Size quota high watermark and the Size quota low watermark as appropriate. Set the Automatically delete faxes older than X days option depending on the length of time you'd like to keep an archive of your received faxes.

■ Select the Inbox tab and set an appropriate drive and folder path to store all incoming faxes. Again, this can be made available to the network users if required. Configure the remaining options similar to the Sent Items tab.

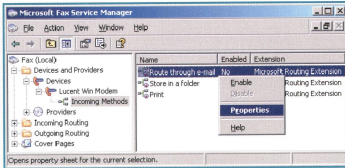
■ Select the Outbox tab and again, configure the Automatically delete faxes older than X days option depending on your requirements. If you send broadcast faxes to STD locations, change the discount rate times. Hit OK to save your settings.

■ Next, expand Devices and Providers > Devices > YourModemName, right-click your fax modem and select Properties. If you have high volume fax traffic, you can configure more than one modem to send and/or receive faxes. Windows 2003 doesn't limit the number of devices that can be configured to send and/or receive faxes simultaneously (Windows 2000 had a limit of two).

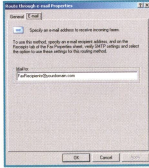
■ On the General tab, select Send faxes and Receive faxes (with multiple modems you can



1 The enable SMTP email receipts delivery option will email your users when their faxes are sent.



2 By routing all incoming fax messages through email, all faxes can be electronically received by a central contact. This contact can then forward the message to the appropriate recipient.



3 All faxes will be automatically sent to this email address.

have dedicated send and receive devices). Hit the Automatic Answer radio button and set the number of rings before answer. Then enter your business name or fax number in the TSID field (this is what's displayed on the recipient's fax machine when a fax is sent from this modem).

■ If your modem supports adaptive answering and you also wish to use the fax modem for things such as remote direct dial-in access, check Enable adaptive answering if supported by the modem check box on the Microsoft Modem FSP tab.

2 Expand Devices and Providers > Devices > YourModemName > Incoming Methods and right-click Route through email and select Properties. Go to the Email tab and enter the email address you want incoming faxes to be delivered to. This can be any valid email address. If you're using Microsoft Exchange on your internal network, deliver the faxes to a Distribution Group and place a mail-enabled Public Folder as well as a nominated individual in the Distribution Group.

3 With this method, one person will receive every fax into their mailbox and can then forward the faxes on to the appropriate person. All users with permission can view the faxes in the Public Folder. Select OK to save your settings.

■ Right-click Route through email and choose Enable to allow the incoming faxes to be emailed to the specified address.

■ If you still want messages on paper, you can have every fax sent to a printer on the network.

With this configuration, your server will answer faxes and route them according to your options. A shared printer called Fax should appear in the printer list on the server.

WINDOWS CLIENT FAXING

To take full advantage of electronic faxing, the shared fax printer must be installed on client PCs.

■ On the client PC, browse to your fax server by selecting Start Menu > Run and type: \\FaxServerName. Right-click the printer named Fax, select Connect... and the printer will install on the client.

■ To send a fax, a user prints normally from any Windows application on the PC and chooses the "Fax on FaxServerName" printer. Users need to complete a one-off wizard and enter their Sender Information Details the first time they do this.

4 When the standard Send Fax Wizard appears, enter the recipient's name and fax number, or choose them from your email contacts via the Address Book button. Next, elect a cover page from the preconfigured list or use one that you've created. You can opt to send the fax immediately or schedule it to send at a specific time. Finally, enter your own email address to receive a delivery receipt once the fax is sent.

This is a great solution for anyone running Windows Server 2003, but many small businesses don't have a server or are using alternative operating systems such as Mac OS or Linux. Luckily, faxing is a very mature medium and there is a variety of solutions available for different operating systems (see over page).

WINDOWS XP SOLUTIONS

Windows XP comes standard with the same client faxing software as Windows Server 2003. Its operation is almost identical, but you're relying on a local modem, local storage of the faxes and you can't deliver the faxes into a mailbox. But as a free solution, it's very useful.

A variety of freeware and commercial add-on programs are available for Windows XP that boost fax functionality. Check out Fax4Outlook (<http://fax4outlook.4team.biz>), which adds a fax icon to common programs and allows storage of faxes in Outlook — without requiring Exchange.

Other products, including RVS-COM (www.rvscom.com), Simply Messenger and FAXserve (www.accpac.com) add functions such as OCR, SMS capabilities, fax mail-merge, fax forwarding, fax retrieval services and junk fax management. And of course, XP is also compatible with WinFAX Pro (www.symantec.com/winfax) and Zetafax (www.zetafax.com), two of the most popular fax programs.

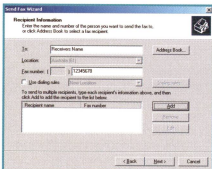
Talk tools

Apart from the very cool Talking Display Unit, National Communications (www.natcomm.com.au) has the greatest array of line sharing devices assembled in one location.

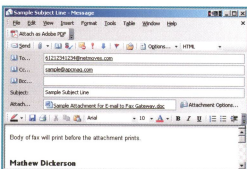
No need to worry about your phone devices being compatible with Telstra's Duet service. The Faxmate Duet Switch allows all fax devices to work with Duet by answering the call and then generating a standard ring tone.

The Auto Select device has Barge-In protection so multiple devices can share a phone line; if any one device is using the line the other devices have to wait until the first device is finished. This is useful for EFTPOS/modem/phone line sharing, and also when you're on the phone at home and the kids want to listen in on your conversation. The Music/MOH Unit allows a small business with just a single telephone line and no PABX to play hold music or a message, giving the impression of a much larger organisation.

Are there occasions when your work computer freezes and you want to be able to reboot it remotely? Use the Remote Telephone Activator and the PC Reset Unit and dial-up to hard reset your PC. And for the last surprise in your box of fancy tricks, buy a Ringmaster and generate your own ring tones and busy signals.



4 Sending a fax from your desktop is a simple matter of following the wizard.



5 Email to fax gateway solutions make faxing documents as easy as writing an email.

LINUX AND MAC OS SOLUTIONS

For Linux, HylaFAX (www.hylafax.org) is the most popular solution. It acts as a central fax server for an organisation with a variety of client operating systems, and can deliver incoming faxes as email messages converted to PDF format. Other options include eFax (<http://home.efax.com>) and Faximum (www.faximum.com).

There is a wide variety of packages available for the Mac, but 4-sight fax (www.4sightfax.com), CommuniGate (www.stalker.com), FaxElite (www.macupdate.com/info.php?id/4115), pagesender (www.smileonmy.com) and FAXstf (www.smithmicro.com) are the most popular, with similar features to faxing solutions on other platforms. These include Windows client software, OCR compatibility, pager support, email-to-fax gateway configurability and the ability to automate sending of faxes via AppleScript.

VOICEMAIL

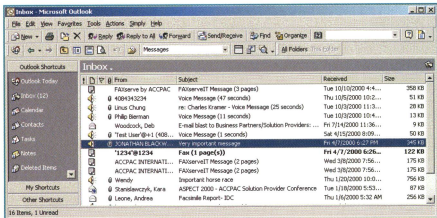
For small businesses with elementary phone systems, voice messaging solutions can be effective and easy to implement. Buy a high-quality voice modem (it must conform to the Unimodem V standard) and plug both the phone line and handset(s) into the modem. Many voice modems come with basic software, and there are other commercial and freeware products that offer enhanced features. These include:

- Delivery of voicemail messages to email.
- Custom call and voicemail routing to mobile phone or paging services.
- Automated attendant to answer calls and offer callers a menu system.
- Caller ID to automatically bring up an Outlook contact.
- Incoming and outgoing call tracking.
- Storage of incoming voice and fax messages, even when your computer is turned off.
- Multiple mailboxes from the one incoming line.

UNIFIED MESSAGING

The aim of most companies within the messaging space is Unified Messaging. The objective is to have access to all of your messages, regardless of their format or the communication equipment you use.

All types of messages can appear in your email client inbox — voice messages can be listened to over your PC's speaker or the telephone, and faxes can be viewed directly in your email client or forwarded to a fax device (such as a hotel's fax machine). All



Total communication: by using voice messaging software in conjunction with your fax manager and email client, all your messages can be viewed from your inbox.

of these functions can be used together and be easily maintained on a mail server.

The majority of products in this space are Windows-based solutions, such as CallAudit Voice (www.apcmag.com/info/CallAudit_Voice), RVS-COM (www.rvscom.com), VOICEServe (www.accpac.com), FAXmaker (www.gfi.com/faxmaker) and EzVoice (www.internetsoftsolution.com). But there are alternatives for Linux and the Mac such as Repartee LX (www.activevoice.com) and Freewebphone (www.apcmag.com/info/Freewebphone). Apps such as Lingo and Reception (www.activevoice.com) rely on specific hardware running the solution to communicate with your PCs.

EMAIL-TO-FAX

The email-to-fax gateway concept is very simple. You send a normal email in the form of 61212341234@netmoves.com or remote-printer.first_last@6121231234.iddd.tpc.int and the fax is sent on your behalf by a remote gateway. This usually doesn't require any software to be installed as it uses the email client.

Many overseas companies offer this functionality for no charge. There are only a handful of Australian services available, and all of them charge, but they're quite cheap. For example, you can send faxes within Australia for 23 cents per page and send faxes to the US for 20 cents per page.

In a test of the OzeFax (www.ozefax.com.au) email-to-fax service, our simple test fax was sent less than 20 seconds after the email was sent. If an attachment is included with the email, it takes a few minutes extra as the attachment must be opened before the fax can be sent.

This sort of service is especially relevant

if you often fax information to STD or IDD locations. It's also very convenient to send one email with all the addresses and fax numbers of the people you want to receive the message. If required, you can even have a fax number or numbers set up by your email-to-fax service provider in different areas or countries. The service provider receives the fax on your behalf and then sends it on to your email.

For further functionality, use the Voice2Email (www.etechedata.com.au) facility, in which the email-to-fax service provider receives voice messages and emails them to you, then sends you an SMS to let you know there's a message waiting.

Look for OzeFax (www.ozefax.com.au), WWFAX (www.wxfax.com.au), Callwave (www.callwave.com), eFax (<http://home.efax.com>), Faxmate (www.faxmate.com) and JConnect (www.j2.com). All provide email-to-fax functions.

KILLER FEATURE

Of all the features in messaging software, the best is the SMS appointment reminder feature. Some messaging programs (RVS-COM and Telemessage, for instance) look at the appointments in your Outlook Calendar and send an SMS based on the Reminder time you've set. For example, doctors could SMS their patients to remind them of a consultation, office staff could book appointments into field staff calendars and they'll be automatically notified, and a company with shift workers could send its staff the week's roster.

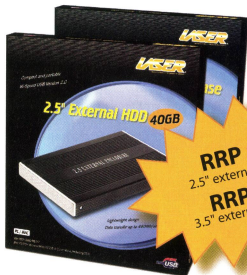
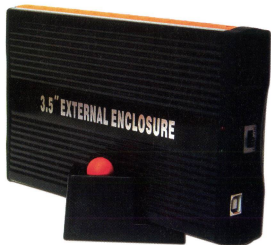
Once you've determined which message functions you require, you can simply piece them together to create your own unified messaging solution. www.apcmag.com

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on the same port. The solution is to remove or modify the second Listen directive.

INVISIBLE .HTACCESS FILES

If an existing .htaccess file is read by Apache, the configuration contained within it overrides the configuration set forth in the httpd.conf file. If you find this alarming, disable the use of .htaccess files from within httpd.conf by using the following directive:

```
AllowOverride None
```

With such a configuration no .htaccess files will ever be processed, they'll just occupy hard disk space. Replacing the keyword **None** with **All** processes all directives contained within the .htaccess file.

CGI ERRORS

Not all errors prevent Apache from starting or make the Apache process unexpectedly terminate. A classic example is when CGI scripts don't run as expected. Just about everyone who has dealt with CGI scripts has encountered the following error:

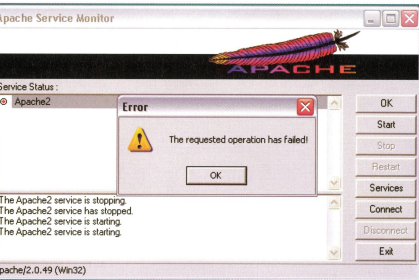
Internal Server Error: Premature End of Script Headers

There are a number of rules to adhere to when working with Perl and CGI scripts. First, the permissions must be correct. The script must be executable and in some cases, cannot be written to by users of the same groups as the owner or anonymous users. On a Linux-based system, 755 permissions are usually the most appropriate.

Second, if scripts must be uploaded to the server via FTP, an ASCII transfer has to be used — uploading it via a binary transfer produces this error every time. Check that the FTP client has CGI and PL file types defined for ASCII transfer only. To ascertain whether this is the cause of your trouble, bring up a command prompt and attempt to execute the script — if it runs, the problem lies elsewhere.

The final common trap relates to **suexec** constraints. Apache executes a script using the credentials granted to the Apache user account on the local system. Suexec allows the script to be executed using a different user's credentials, making script execution less of a security risk. The suexec wrapper goes through a series of tests before the script can be executed and if any of these tests fails, an Internal Server Error occurs and a log entry is made in the suexec_log file.

To determine whether your instance of Apache uses suexec, enter:



Uh-oh! The Windows-based Apache server monitor is rarely descriptive with its error messages.

```
/path/to/apache/httpd -l
```

If the following appears, suexec isn't used and this last trap doesn't apply:

```
suexec: disabled; invalid wrapper  
/var/www/html/bin/suexec
```

If suexec is enabled, you can find the location of the suexec file by running:

```
suexec -V
```

HANDLE WITH CARE

What happens if your browser wants to download the CGI script rather than let the server process it? The problem here lies in the server configuration — Apache should execute the script and return the result. Double-check the httpd.conf file as well as any .htaccess files that may affect the script. Ensure that the **Options Includes** directive is turned on (normally done via the **Options +Includes** directive), and that the appropriate **AddHandler** directives are set.

AddHandler instructs Apache how to handle certain files. In the case of a script, Apache should process the script instead of passing it back to the client. For instance, to pass CGI and Perl scripts to the mod_cgi interpreter in the httpd.conf file, use:

```
AddHandler cgi-script .cgi .pl
```

To define a handler type in a .htaccess file, use the **SetHandler** directive instead.

For a full list of handlers go to <http://httpd.apache.org/docs/2.0/handler.html>.

REWRITING THE RECORD

If you find that some of the implemented rewrites don't work, check that the Pass Through **[PT]** flag appears at the end of the **RewriteRule** line as demonstrated:

```
RewriteRule "(.*)foo(.*)" "  
$1bar$2" [PT]
```

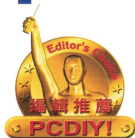
Without the Pass Through flag, Apache ceases processing the URL. Rewrite directives are dealt with early in the URL handling process, so if the Pass Through flag is missing, Apache won't process any alias, redirect or other URL modification rules.

INSERT GENERIC ERROR MESSAGE

When attempting to start Apache on a Windows system, you may see the message "System Error 1067 has occurred. The process terminated unexpectedly." This generic error means the application failed to start and Windows doesn't know why.

If you get this message and can't find any useful information in the error log, try running the Apache Web Server interactively by loading a command prompt (Start > Run > cmd) and running Apache from within the directory it's installed in. If you're dumped back to a command prompt, some more information should be supplied. If nothing shows up on the screen, Apache has started. Hit Ctrl+C to exit Apache and try starting it again in the usual way. [\[11\]](#)

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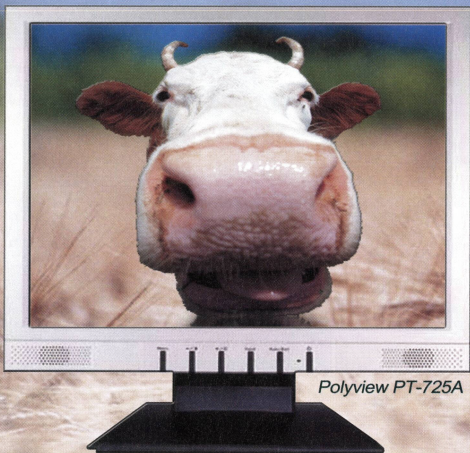
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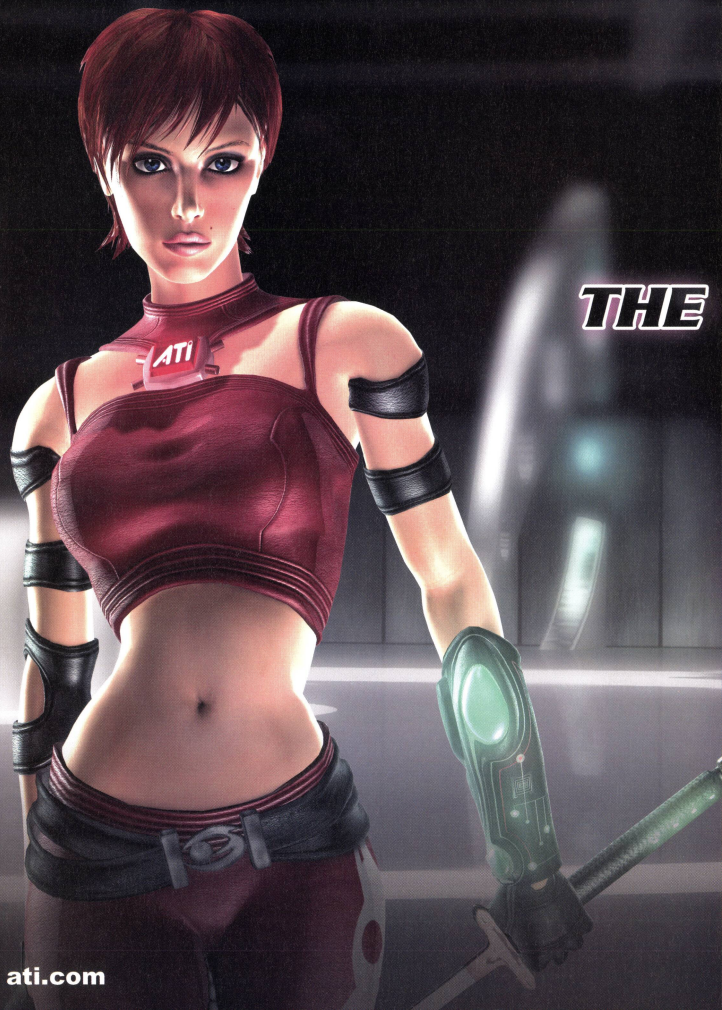
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EFTPOS switch will allow your existing EFTPOS device to share any existing Single Telephone Line, Fax Line or a Multi Line (PABX) phone system. Provides automatic connection on dialing. BARGE-IN protection prevents intrusion when line is in use. Alternative model will allow operation on 2 lines.



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Our AUTOMATIC ANNOUNCEMENT DEVICE will ANSWER your incoming telephone calls, play a pre recorded announcement and then resume ringing of your telephones, PABX or other Multi Line phone system. Ideal for announcing change of number or that the call will be recorded.



MUSIC OR MESSAGE ON HOLD FOR ANY LINE

MESSAGE CENTRE

DMC PRO, Australia's Leading On Hold player, is an MP3 based DIGITAL Message On Hold Device, designed to provide the High Quality and High Reliability that is necessary for all telephone calls on hold applications. Easy message change provided by replacing memory card.



ELECTRONIC MESSAGE UPDATE

DMC-PRO is available with range of optional Automatic electronic message update methods including Email, Modem, FTP, Network IP and GPRS. We have a National Network of Dealers ready to produce your customised message.



SINGLE LINE ON HOLD

Just plug our MCH Line Sharer into any socket on your single telephone line, connect any audio source (Radio, PC or DMC) and you now have a professional telephone line On Hold facility for your existing telephones.



AUTOMATIC CALL ATTENDANT

Our single line CALL ATTENDANT will answer your incoming calls after 4, 6 or 8 rings, play a pre recorded message, transfer your call on hold until you are able to answer. Also provides Message On Hold facility for your single line.



CONTROL YOUR EQUIPMENT BY TELEPHONE LINE

REMOTE TELEPHONE ACTIVATOR

Call in to Switch ON, Switch OFF or RESET your PC, SERVER or any electrical equipment by telephone line using touch tone commands. RTA connects to any telephone line. Requires PCU or PCR accessory.



RTA-PRO VERSION

PRO version provides independent control of 2 separate outputs, with PIN number security. Status tones for each output are provided on answer. Shares an existing line when used with the Multiple Number service.



POWER CONTROL UNIT

PCU connects direct to the RTA and also to your power socket to allow telephone line dial in switching of the 240V supply connected to your equipment. Easy Plug In User Installation. Controls up to 10 Amps.



PC RESET UNIT

PCR connects to any PC to allow remote telephone PC RESET, or can also be used to turn ON or OFF PC's with ATX style motherboards. Easy User Installation.



TELEPHONE LINE DOOR STATION AND EXTENSION TRANSFER

DOOR STATION UNIT

Will RING all of your telephones when a visitor arrives at your front door or gate. Answer to communicate. Open the door or gate with touch tones. Operates on any telephone line or multi-line phone system. Requires surface mount or flush mount door phone.



SURFACE MOUNT DOOR PHONE

This unit provides for quick and easy mounting direct onto any wall surface. Your visitor just presses the integral call button to ring your telephones. Provides clear 2 way communication as soon as you answer.



FLUSH MOUNT DOOR PHONE

This attractive Stainless Steel unit is designed for a flat recessed fit into your wall surface. Your visitor just presses the integral call button to ring your telephones. Provides clear 2 way communication as soon as you answer.



TELEPHONE CALL TRANSFER

Easy-Transfer allows you to answer a call on any telephone line and then TRANSFER the call to another telephone fitted on the same line. Also provides INTERCOM facility. Uses your existing telephones.



ARE YOUR PRODUCTS OR SERVICES WORTH TALKING ABOUT ?

TALKING DISPLAY UNIT

TDU will play 1 or more pre-recorded messages as soon it is triggered by a movement sensor, a switch, or at a preset time interval. Ideal for Product Promotions, Product Information, Message Warnings etc.



MULTIPLE INPUT UNIT

MIU will allow for up to 12 separate movement sensors or switches to be connected to the TDU. Each sensor triggers its own unique message, output via any 8 ohm unpowered, powered or amplified speaker.



SPEAKER SWITCHING UNIT

SSU will allow up to 12 separate speakers to be connected to the TDU so that each sensor triggers its own separate message, output on its own separate speaker. Background music can be played at all other times.



AUDIO SWITCHING UNIT

ASU will allow the TDU to be connected to any existing PA or Background Music system. The existing PA or Background Music system is then muted or faded whenever a TDU message is broadcast and then reconnected when finished.



TELEPHONE LINE SIMULATORS FOR TESTING, TRAINING, DEMONSTRATION

RINGMASTER STD

Will allow any 2 telephone devices to ring and communicate with each other, without the need to make costly calls and occupy 2 lines. Ideal for Testing, Training & Demonstration of all analogue telephone devices.



RINGMASTER PRO

Provides all facilities of the STD model, and in addition provides Australian Dial Tone, Busy Tone and multiple ring outputs including FaxStream Duet, Multiple Number ring. USA & UK versions are also available.



RINGMASTER CLI

Provides all facilities of the PRO model and in addition will generate CallerID (Calling Number Display) output in conjunction with any Telstra ring pattern. Provides 10 pre-set alphanumeric & user definable transmissions.



RINGMASTER INTERNATIONAL

International Version provides switch selectable dial tone, busy tone and ring output for operation for over 20 countries. Ideal for exporters of telecommunications equipment.



MANUFACTURED IN AUSTRALIA



NATIONAL COMMUNICATIONS

Australia's Telephone Line Sharing Company Since 1990

For a Full Description of your solution, please call:

Factory direct on (07) 5596 5128

SUPPLIED WORLDWIDE



• UNCONDITIONAL 30 DAY MONEY BACK GUARANTEE • 2 YEAR WARRANTY • NEXT DAY DELIVERY • DEALER ENQUIRIES WELCOME •

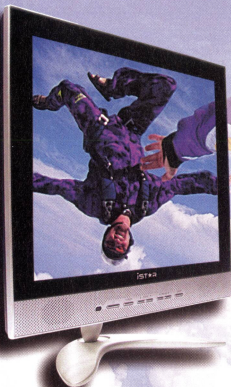
Visit our comprehensive Web Site for information, other products, brochures, prices, product sheets, installation diagrams or to place an order.

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WITH PROTECTION.



• Crisp and Clear

With advanced features such as an anti-reflective glass panel, and up to 450:1 contrast ratio and 300 cd/m² brightness, coupled with the latest in Active Matrix display technology, produces an image with superior clarity and sharpness.



• Professional Design

Thin, sleek designs in a highly versatile style mean that iSTAR's monitors can be used anywhere, anytime, for multiple uses.

Proudly distributed by:



ADO ELECTRONIC INDUSTRIAL (AUSTRALIA) PTY LTD

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Ph: (08) 8371 0228

Also available from iSTAR:



ID-17V55BK



ID-18V55BK



ID-1785SL

Why glass panels?

Using glass panels embedded into iSTAR's monitors produce a sharper, crisper image, easier on the eyes than a raw display, and produces a superior clarity, not to mention protection from chemicals and fingerprints. With the latest technology in Active Matrix TFTs, colours are more vibrant, images are sharper, and eyestrain is minimised.



More features

Industry-standardised VESA wall-mount
Plug and Play compatibility

Kensington Lock Slot
Wide Viewing Angle

OCTOBER 2004

APC

**POWER BACKUP = POWER
PROTECTION**

PAGE 18

ACER

**P4 2.8Ghz DESKTOP
+ 17" LCD MONITOR
\$1,749**

PAGE 9

MAXTOR

**ONE TOUCH BACKUP
FROM \$265**

PAGE 48



SERVER BUNDLE



i n v e n t



P2686

\$1,399

PAGE 7

PRICES AVAILABLE FROM 1st to 31st OCTOBER 2004

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HT.COM.AU



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INDEX

OCTOBER 2004

ORDERING & DELIVERY

Orders can be collected from one of our locations or delivered, anywhere Australia wide. Delivery times quoted by sales staff are our best estimates based on information received from the manufacturers. Please inquire about all freight charges as they vary for delivery locations and items purchased. The following estimates are offered as a guide only based on state capital metropolitan deliveries.

UNDER 3KG \$10

3 KG - 10 KG \$17

OVER 10 KG \$CALL

PRICING

All purchases subject to terms and conditions and returns policy. Prices in this catalogue exclude delivery charges.

All items in this publication have been included in good faith on the basis that the goods, as described, will be available at the time of sale. A failure by supplier to deliver in accordance with sample, description or at all or other unintentional causes may result in some lines being unavailable. Display accessories shown in photographs throughout this publication are not included in the price. Whilst every care has been taken to ensure accuracy in this catalogue, we reserve the right to change incorrect prices resulting from printing or typographical error. Every effort has been made to ensure that Harris Technology's suppliers maintain their prices, so that Harris Technology can supply products to you at the prices advertised in this catalogue. Prices quoted are correct at the time of publication and are subject to change without notice due to matters such as currency fluctuations affecting our suppliers. Harris Technology publishes price changes both immediately on its website www.ht.com.au and by public notice on the first Tuesday of each month in the Australian. GST included in all product pricing.

DESKTOPS, NOTEBOOKS & COMMUNICATION

Toshiba	4-5
HP Desktops, Notebook & Servers	7
Acer Notebook & Desktops	8-9
Sony Notebooks	10

ACCESSORIES

Targus	11
Logitech	25

BACK-UP & NETWORKING

Watchguard	12
Linksys	13
Netgear	14-15
Netcomm	16
3Com	17
APC	18
ServerLink	20
Comsol	21
D-Link	22-23
Belkin	26

PRINTERS & SCANNERS

Epson	29
Canon Printers	31
HP	32-35
Samsung Printers	36
Konica Minolta	37
Lexmark	38

DIGITAL CAMERAS & MULTIMEDIA

Canon Digital Cameras	30
Pinnacle Systems	44
New Magic	44

RENTSMART

RentSmart Offer	6
-----------------	---

DISPLAYS

Sony Video Conferencing	24
HP Projectors	27
Samsung Monitors	28

STORAGE & MEDIA

Quantum	19
Imation	38
Sony Media	40
AF	41
Fellowes	41
Region 4	42
Pioneer	43
Lacie	44
Hitachi	44
lomega	47
Maxtor	48

SOFTWARE APPLICATIONS

AutoDesk	49
Symantec	50-51
Macromedia	52
FileMaker	53
Corel	54
Business Objects	55
Dantz Retrospect	56
ScanSoft	56
Legrand	57
Quicken	58
TurboCAD	58
ACTI	59
Trend Micro	59
Microsoft	60-61

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1300 72 9020



VENDOR RELATIONSHIPS

TRULY VENDOR INDEPENDENT

We invest significantly to build strong relationships with Australia's premier vendors in a quest to bring their latest technologies to customers at competitive prices. This means we have an enviable list of partner accreditations. We're in the top 10 Australian resellers for a host of vendors including Toshiba, HP, Sony, Microsoft, IBM, Lexmark, and Symantec.

It's this vendor independence and wide-ranging expertise that allows us to identify our customers needs and choose from all the top vendors to satisfy those needs. In fact, we can supply **more than twenty thousand hardware and software lines**, peripherals, consumables, office supplies, surveillance solutions, and professional services.

And because Harris Technology products and solutions are delivered on time, at the right price, we now **serve more than 100,000 people from a range of enterprises**. Below is just a small selection of some of the vendors we partner with to ensure we meet your business IT needs.



MICROSOFT
CERTIFIED PARTNER

SYMANTEC
GOLD PARTNER

TOSHIBA
PLATINUM PARTNER &
2004 RESELLER OF THE YEAR

SONY
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MACROMEDIA
PREFERRED RESELLER

PALM
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DIAMOND PARTNER

HP
WORKGROUP PARTNER

WATCHGUARD
PARTNER

TREND MICRO
SILVER PARTNER

3 COM
SILVER PARTNER

CISCO SYSTEMS
PREMIER PARTNER

TECRA M2, S1 & STORAGE

TOSHIBA & IOMEGA
DATA PROTECTION BUNDLE

Order any Toshiba notebook with the Data protection bundle (includes Toshiba 5GB Type II ATA PC Card HDD and Iomega's Instant Automatic Backup software)

P6621 **\$440**TOSHIBA & MICROSOFT OFFICE
PRODUCTIVITY BUNDLE

Order any Toshiba notebook with Microsoft Office Productivity bundle (includes Microsoft Office Small Business Edition 2003)

P6620 **\$440**TOSHIBA BUSINESS
SOLUTIONS PROMOTION

Order any one of the above promotions (Part: P6621 or P6620) with your order of a Toshiba notebook from 01/10/04 to 31/10/04 or while stocks last. Must be ordered in conjunction with notebook. Limit of 1 promotion per notebook. Not available with any other offer.

BONUS OFFER
^ Receive a bonus bag and additional 256MB RAM (not installed) with any purchase of Tecra M2 or Tecra S1 series. Offer valid from 01/10/04 to 31/10/04.

Only available while stocks last. Not available with any other offer.

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

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TECRA M2

The Tecra M2 series is the ideal mobile computing platform for business. Boasting high level business performance features, extended freedom to roam wherever you are required to work and versatile expansion providing room to grow. These features combine in a robust magnesium alloy chassis to protect your investment and extend product life. The Tecra M2 is easy to deploy and manage through a scalable technology platform with long life cycles reducing the cost of ownership.

Tecra M2s weigh from 2.26kg and include modem and LAN capabilities.



MODEL	TECRA M2	TECRA M2	TECRA M2	TECRA M2
MOBILE PENTIUM M	1.5GHz	1.6GHz	1.7GHz	735 - 1.7GHz
RAM STD	512MB	512MB	512MB	512MB
HARD DRIVE	40GB	60GB	80GB	80GB
SCREEN	14.1" XGA TFT	14.1" XGA TFT	14.1" XGA TFT	14.1" XGA TFT
VIDEO RAM	64MB	64MB	64MB	64MB
OPTICAL DRIVE	DVD/CD-RW	DVD Super Multi	DVD Super Multi	DVD Super Multi
WIRELESS LAN	Antenna	WiFi b/g	WiFi b/g	WiFi g & BT
WARRANTY	1 year	1 year	1 year	1 year
OP SYSTEM	XP Pro	XP Pro	XP Pro	XP Pro
RENT*	\$20.67/wk	\$31.75/wk	\$34.72/wk	\$37.96/wk
PART NUMBER	N6274	N6275	N6276	N6277
PRICE	\$2,795	\$3,095	\$3,499	\$3,850

TECRA S1

The Toshiba Tecra S1 delivers outstanding performance and seamless wireless connectivity to business computing. Now free to perform at their best wherever business takes them, executives will appreciate the added mobile productivity of the Tecra S1 with up to 4.5 hours of battery life. Easy to deploy and manage, the Tecra S1 is ideal for business customers wanting to reduce total costs of ownership and increase product lifecycle. Perfect for special applications and multi-tasking, the award winning Tecra S1 series rivals many desktops in power and scalability. All Tecras include modem and LAN capabilities.



MODEL	TECRA S1	TECRA S1	TECRA S1
MOBILE PENTIUM M	715 - 1.5GHz	725 - 1.6GHz	735 - 1.7GHz
RAM STD	512MB	512MB	512MB
HARD DRIVE	40GB	60GB (7200rpm)	80GB
SCREEN	15" XGA TFT	15" SXGA+ TFT	15" UXGA TFT
VIDEO RAM	32MB	32MB	32MB
OPTICAL DRIVE	DVD Super Multi	DVD Super Multi	DVD Super Multi
WIRELESS LAN	WiFi b/g	WiFi b/g & BT	WiFi b/g & BT
WARRANTY	1 year	1 year	1 year
OP SYSTEM	XP Pro	XP Pro	XP Pro
RENT*	\$32.16/wk	\$36.67/wk	\$42.30/wk
PART NUMBER	P9081	P6963	P9082
PRICE	\$3,135	\$3,695	\$4,290

TECRA A2 & PORTÉGÉ SERIES & PROJECTORS

TECRA A2

TOSHIBA'S NEW TECRA A2 NOTEBOOK FOR SMB

Featuring the latest Mobile Intel Pentium® M or Intel® Celeron® M processor and with a standard battery life of up to 4 hours, all four models in the series deliver high levels of performance and reliability. Also helping to maximise productivity is the full range of expansion and connectivity features including a PC Card slot, two USB 2.0 ports, an international V.90 modem and a 10/100 Mbit Ethernet LAN port.

Optional Port Replicator for the A2 Tecra notebook range



TECRA	TECRA A2	TECRA A2	TECRA A2	TECRA A2
PROCESSOR	Cel-M 330 1.4GHz	Cel-M 340 1.5GHz	P-M 715 1.5GHz	P-M 725 1.6GHz
RAM STD	256MB	256MB	512MB	512MB
HARD DRIVE	40GB	60GB	60GB	80GB
SCREEN	14.1" XGA TFT	14.1" XGA TFT	15" XGA TFT	15" XGA TFT
OPTICAL DRIVE	DVD/CD-RW	DVD-SuperMulti	DVD-SuperMulti	DVD-SuperMulti
56K V.90 & 10/100 LAN	Yes	Yes	Yes	Yes
WIRELESS LAN	WiFi b/g	WiFi b/g	WiFi b/g	WiFi b/g
WARRANTY	1 year	1 year	1 year	1 year
OP SYSTEM	XP Pro	XP Pro	XP Pro	XP Pro
RENT*	\$341/wk	\$341/wk	\$25.59/wk	\$30.46/wk
PART NUMBER	P8512	P8513	P8514	P8515
PRICE	\$CALL	\$CALL	\$2,475	\$2,970

PORTÉGÉ SERIES



*These three models have Intel® Centrino technology

PORTÉGÉ	R100*	M200 TABLET*	M100*
MOBILE PENTIUM M	1.1GHz	1.6GHz	1.3GHz
RAM STD	512MB	512MB	512MB
HARD DRIVE	40GB	80GB	80GB
SCREEN	12.1" XGA	12.1" SXGA+	12.1" XGA
56K V.90 & 10/100 LAN	Yes	Yes	Yes
WIRELESS LAN	WiFi b/g	WiFi b/g	WiFi g & BT
OPTICAL DRIVE	No	No	DVD/CD-RW
WEIGHT	From 1.1kg	2.1kg	From 1.8kg
OP SYSTEM	XP Pro	XP Tablet	XP Pro
RENT*	\$39.39/wk	\$44.32/wk	\$41.21/wk
PART NUMBER	P3052	P2478	N9189
PRICE	\$3,995	\$4,495	\$4,180

SATELLITE P20



- Intel Pentium 4 with HT 3GHz
- 512MB DDR RAM (2GB Maximum)
- 80GB Hard Disk
- 17" Wide XGA TFT (1440 x 900) display
- DVD SuperMulti Drive
- 56K V.90 modem
- Wireless a/b/g
- Microsoft® Windows® XP Professional
- 1 year courier pickup & return parts and labour warranty

Rent* \$43.33/wk

\$4,395

N7158

DLP PROJECTORS



S20 image

- Excellent brightness
- Quiet operation
- 2 year warranty with 3 Month Hot swap

MODEL	S20	T90
ANSI	1400	2000
WEIGHT	3.0kg	2.8kg
RES	SVGA	XGA
RENT*	\$30.70/wk	\$34.72/wk
PART	P0226	P0228
PRICE	\$1,799	\$3,499

*RENTSMART

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LATEST OFFER FROM RENTSMART

**6 GREAT REASONS
TO RENTSMART**

ALWAYS HAVE THE LATEST EQUIPMENT
RentSmart enables you to update to the latest equipment as your needs change or your equipment outdates.



TAX DEDUCTIBLE*
If you are using your equipment for business purposes, your rental payments can be fully tax deductible.



FAST IN STORE APPROVAL
You can be approved to RentSmart up to \$20,000 of equipment in just minutes whether you're in store or at your office.



SAVE YOUR MONEY
There are no deposits or upfront payments. So with RentSmart you can keep your money working for you in more profitable ways.



GET EVERYTHING YOU WANT TODAY
RentSmart gives you greater flexibility for your technology needs. Why not bundle together a wide range of office equipment, computer software and furniture all into one convenient plan?



AFFORDABLE MONTHLY PAYMENTS
Choose from a 2, 3 or 4 year rental plan to spread the cost of your equipment over its useful life.

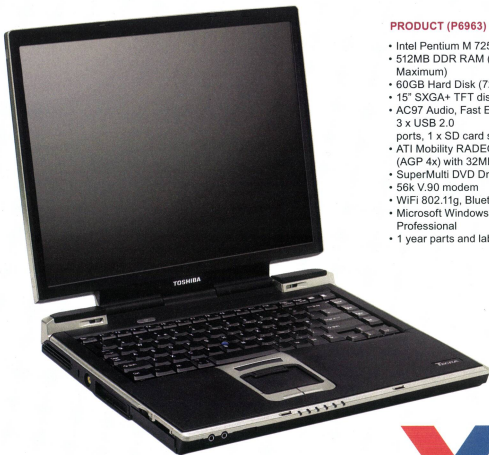
*May be 100% Tax Deductible if used solely for business. See your accountant or tax advisor for personal tax advice.

RENTSMART

A TOSHIBA TECRA S1 NOTEBOOK

FOR \$31.64 P/W

BASED ON A 48 MONTH RENTAL TERM

**PRODUCT (P6963) INCLUDES:**

- Intel Pentium M 725 1.6GHz
- 512MB DDR RAM (2GB Maximum)
- 60GB Hard Disk (7200 rpm)
- 15" SXGA+ TFT display
- AC97 Audio, Fast Ethernet, 3 x USB 2.0 ports, 1 x SD card slot
- ATI Mobility RADEON 9000 (AGP 4x) with 32MB Video RAM
- SuperMulti DVD Drive
- 56k V.90 modem
- WiFi 802.11g, Bluetooth
- Microsoft Windows XP Professional
- 1 year parts and labour warranty

**TERMS AND CONDITIONS:**

RentSmart is a rental facility provided by RentSmart Pty Ltd ABN 16 073 225 457 and is available to approved customers on selected products with a total retail value over \$550 (GST inc). Advertised figure are based on a 48 month rental term. Phone RentSmart on 1300 855 555.



HP DESKTOP SERIES, NOTEBOOK & SERVER

HP COMPAQ DX6100 MT SERIES



CHASSIS	MICRO TOWER
PROCESSOR	P4HT-2.8GHz
MEMORY	512MB
HARD DRIVE	80GB
OPTICAL DRIVE	COMBO
WARRANTY	3 years parts, 1 year labour and on-site repair
OP SYSTEM	XP Pro
RENT*	\$15.12/wk
PART NUMBER	P7053
PRICE	\$1,349

HP COMPAQ DX6100 ST SERIES



CHASSIS	SLIM TOWER	SLIM TOWER
PROCESSOR	P4HT-2.8GHz	P4HT-3.2GHz
MEMORY	512MB	512MB
HARD DRIVE	80GB	80GB
OPTICAL DRIVE	COMBO	COMBO
WARRANTY	3 years parts, 1 year labour and on-site repair	
OP SYSTEM	XP Pro	XP Pro
RENT*	\$15.12/wk	\$17.92/wk
PART NUMBER	P7058	P7062
PRICE	\$1,349	\$1,599

HP COMPAQ NX9040 NOTEBOOK

The HP Compaq nx9040 Business Notebook is packed with advanced technology features offering solid performance at a surprisingly affordable price.

Intel Celeron M 330 1.4GHz
256MB RAM (2GB Max)
40GB Hard Drive
CD-ROM Drive
Floppy Disk Drive
Built in Modem and LAN
Intel Extreme Graphics 2
15" XGA Display
Windows XP Professional



Rent* \$16.74/wk

\$1,495

P9884

HP PROLIANT ML110 SBS SERVER BUNDLE



Windows
Small Business Server 2003

Microsoft Windows SmallBusiness Server 2003 + 5 CALs standard (pre-installed)
The ProLiant ML110 makes small networks hassle-free. This powerful yet simple platform provides all the relevant server features in an easy-to-use package. Practical performance, such as Intel Pentium 4 processing, ECC memory, and PCI-X support deliver the IT functionality small businesses require.

- Intel Pentium 4 2.80E GHz with HyperThreading Technology
- 512MB PC3200 DDR SDRAM
- Broadcom 5705 PCI Gigabit NIC (embedded) 10/100/1000 WOL (Wake on LAN)
- 36.4GB Ultra320 SCSI 10K
- Internal Storage 288GB maximum
- 48x IDE (ATAPI) CD-ROM Drive
- One year limited warranty on parts, labour and on-site

Rent* \$15.68/wk

P2686

\$1,399

*RENTSMART

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NOTEBOOKS

ACER
ACCESSORIESTRAVELSURE
CARRY CASEP0448 **\$49**USB OPTICAL MOUSE
Silver USB mini optical with
scroll wheelL1831 **\$35**EXTERNAL USB 1.44MB
FLOPPY DISK DRIVEL1793 **\$179**ADDITIONAL BATTERY
for TravelMate 2302Q0298 **\$99**AC ADAPTOR + POWER CORD
for 2000 and 2500 SeriesL1702 **\$137**TARGUS USB 2.0
MOBILE PORT STATIONN0426 **\$249**

*RENTSMART

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PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

TRAVELMATE 2302LMI

The TravelMate 2000 series all-in-one value notebook from Acer is a versatile and dependable portable solution. Ideal in any home or office environment, the TravelMate 2000 is the right answer.

- Intel Celeron M 330 (1.4GHz)
- 256MB RAM
- 40GB Hard Disk Drive
- DVD±RW Drive
- 15" XGA TFT up to 64MB Shared Video Memory
- Built-in 56Kbps fax/modem + 10/100 Ethernet
- 802.11g WiFi
- Lithium-Ion battery up to 5 hours life
- 3 x USB 2.0 ports
- 1 x Type II PCMCIA
- Weighs 2.9kg
- Windows XP Professional



Rent* \$21.28/wk

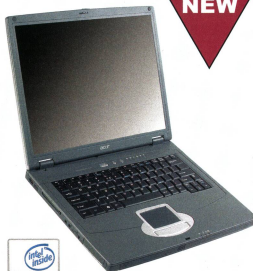
P9469

\$1,899

TRAVELMATE 292LMI

The TravelMate 290 series blends high performance Centrino technology and MediaBay flexibility, in a lightweight design with generous battery life and communications capabilities. An all round performer, ideal in any home or office environment.

- Intel Centrino Pentium-M (1.5GHz)
- 2x256MB RAM
- 40GB Hard Disk Drive
- DVD±RW Drive
- 15" Active colour XGA screen
- Built in modem, Ethernet, WiFi g
- Fast Infra-red, FireWire, S-Video ports
- & 3 USB 2.0 Ports
- ATI Mobility Radeon 9700 accelerator with 64MB DDR RAM
- Weight from 2.56 Kg
- Lithium Ion battery up to 5.5 hours life
- Windows XP Professional



Rent* \$26.88/wk

N6164

\$2,599ACER'S 2 HOUR COMMITMENT WARRANTY EXPRESS SERVICE
GUARANTEES THAT YOU'LL NEVER BE KEPT WAITING AGAIN

1 year return to base with 2 hour Express Service. 2 hour repair turnaround available in Brisbane, Sydney, Melbourne, Perth, Canberra, Adelaide, Hobart, Auckland, Christchurch & Wellington.



harris technology



Desktops

HIGH PERFORMANCE COMPUTING AT AN AFFORDABLE PRICE

ACER POWER F1 MICROTOWER SERIES

Ideal for small business PC users, the AcerPower F1 series is a high performance desktop PC at an affordable price. Available with the full range of Intel Celeron and Pentium 4 processors (with the option of Hyper-Threading technology and up to 1MB L2 cache), the AcerPower F1 also features upgradeable graphics, integrated LAN and audio.

The micro-tower housing design provides total structural integrity, durability and operational peace of mind integrated within an attractive and highly usable housing.

THREE GOOD REASONS TO CHOOSE THE ACERPOWER F1:

1. Uncomplicated and to the point, designed for users who value a straightforward computer delivering the latest processing power and the ability to handle complex business tasks efficiently.
2. The latest in proven technology combined with Acer's high-level reliability gives users a dependable and cost-effective configuration that both simplifies management and lifts office productivity.
3. Offers multiple means to upgrade and expand functionality, ensuring businesses make the most of their investment.

ACER AL1712M 17" BEIGE LCD WITH SPEAKERS

Size: 17.0" LCD
Resolution (max.):
1280 x 1024 @ 75 Hz
Response Time: 20 ms
Weight: 4.3 kg
Audio: Built in stereo
speakers



Rent* \$6.72/wk

P9992

\$600

ACER POWER MICROTOWER

- Pentium 4 2.8GHz (533MHz)
- 256MB RAM
- 40GB
- DVD/CDRW Combo
- Windows XP Professional
- 1 year onsite warranty



Rent* \$12.87/wk

P3109

\$1,149

MODEL	POWER F1	POWER F1	POWER F1
PROCESSOR	Cel 2.8GHz	Cel 2.8GHz	P4 3.0 GHz HT
MEMORY	256MB	256MB	256MB
HARD DRIVE	40GB	40GB	80GB
OPTICAL DRIVE	CD-ROM	DVD/CDRW Combo	DVD/CDRW Combo
10/100 ETHERNET	YES	YES	YES
MODEM 56k V.90	NO	YES	YES
WARRANTY	1yr on-site	1yr on-site	1yr on-site
OP SYSTEM	XP Pro	XP Pro	XP Pro
RENT*	\$10.07/wk	\$11.19/wk	\$14.56/wk
PART NUMBER	P3103	P3108	P5923
PRICE	\$899	\$999	\$1,299

ACER POWER F1 MICROTOWER



SPECIFICATIONS:

- Intel Pentium 4 3.0GHz (800MHz FSB)
- 512MB RAM
- 80GB (7200RPM)
- 56K Internal Modem
- DVD +/- RW
- Microsoft Windows XP Professional
- 1 year on-site Warranty

Rent* \$16.80/wk

Q0165

\$1,499

ACER AL1912M 19" 1280 X 1024 LCD



SPECIFICATIONS:

- Size: 19.0"
- Resolution: 1280 x 1024 @ 75 Hz
- Super contrast 500:1
- Response Time: 16ms
- Weight: 5.5 kg
- Built in stereo speakers

Rent* \$11.75/wk

N0220

\$1,049

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

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SONY MICROVAULT & VAIO NOTEBOOKS

MICROVAULT

USB 2.0 PORTABLE STORAGE DEVICE.

Software Bundle enables you to:



ELITE SERIES

N1310	128MB	\$89
N1311	256MB	\$149
N1312	512MB	\$279

MINI SERIES



N1313	64MB	\$69
N1314	128MB	\$105
N1315	256MB	\$159

BIOMETRIC



Biometric Micro Vault 128MB with Finger Print Security Recognition

N2862	128MB	\$182
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*RENTSMART

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VAIO A SERIES



**15.4" WIDE
SCREEN
LCD**



VGNA15GP

The A15GP series is a fully featured notebook with all the trimmings. Superb performance matched only by its unique and stylish design. Boasting many great features like an Intel® Pentium® M Processor, DVD/CD -RW drive, 512MB of RAM, ATI RADEON 9200 Graphics card, integrated wireless LAN (802.11b/g) and of course, Sony's original suite of software to help you edit and share your favourite home movies and stills.

- Pentium M 1.5GHz
- 15" XGA Display
- 512MB RAM
- DVD/CD-RW Combo Drive
- 40GB HDD
- 64MB Video RAM
- Wireless 802.11g
- XP Professional

Rent* \$25.84/wk

N8934

\$2,499

VGNA19GP

The A19GP series has gone wide! You can now enjoy your DVDs in true widescreen and with brilliant colour reproduction. Thanks to its Clear Bright screen with dual lamps the A19GP will deliver an amazing picture, brighter than ever and unmatched by most other notebooks. And when play time is over the A19GP will power through your work in no time at all with the powerful Intel Pentium M processor, 512MB RAM and very generous 60GB HDD.

- Pentium M 725 (1.6GHz)
- 15.4" WXGA LCD (1280 x 800)
- 512MB RAM
- DVD±RW Drive
- 60GB HDD
- 64MB Video RAM with Clear Bright and Dual Lamp
- Wireless 802.11g
- XP Professional

Rent* \$39.43/wk

P6098

\$3,999

ULTRA PORTABLE FOR THE MOBILE PROFESSIONAL

**13.3" WIDE
SCREEN
LCD**



VGNS18GP

The VAIO S18, combining a widescreen LCD and a sleek lightweight chassis, is able to surpass the boundaries between personal and business requirements. With a new slim black and metallic silver design and weighing just 1.89kg, the brushed magnesium case opens to reveal an exceptional 13.3" WXGA screen.

- Pentium M 1.6GHz
- 13.3" Wide WXGA Display
- 512MB RAM
- DVD-RW Drive
- 60GB HDD
- 32MB Video RAM
- Wireless 802.11g
- XP Professional

Rent* \$39.43/wk

P0024

\$3,999

GET MOBILE... GET TARGUS

CITYGEAR RANGE



CITYGEAR NEW YORK



CITYGEAR LOS ANGELES



CITYGEAR CHICAGO



CITYGEAR ATLANTA

FEATURES (NOT APPLICABLE TO ALL CASES IN THE RANGE):

Removable mobile phone pouch
Padded shoulder straps (Backpack has padded air-mesh shoulder straps)
CityGear Chicago's main compartment for files includes soft rack

- Removable DVD/CD sleeve holds 8 discs
- Additional file storage in main compartment
- Removable mesh accessory pouch
- Zip down workstation
- Side water bottle pocket

Q0141 CITYGEAR NEW YORK **\$89**

Q0142 CITYGEAR LOS ANGELES **\$119**

Q0143 CITYGEAR CHICAGO **\$119**

Q0144 CITYGEAR ATLANTA **\$59**

WORKPLACE ENHANCEMENT

MOBILE PORT STATION



Expand your notebook's capabilities! Add audio, ethernet, serial, parallel and up to five USB devices like mice, joysticks, keyboards and more.

N0426 **\$249**

USB 2.0 MOBILE PORT REPLICATOR



Ideal for home, office or on the road this portable station provides support for both legacy (serial, parallel and PS/2) and USB 2.0 devices.

P2695 **\$139**

UNIVERSAL MONITOR STAND



H0569 **\$79**

NOTEBOOK LCD/MONITOR STAND



K1787 **\$32**

TABLET PC & NOTEBOOK STAND



M9827 **\$34**

IB: Monitor & Notebook not included.

Image for illustration purposes only.

WIRELESS ACCESSORIES

10 CHANNEL WIRELESS MINI OPTICAL MOUSE



Automatically searches up to 10 channels, assuring interference free operation in crowded environments.

P2690 **\$99**

WIRELESS MULTIMEDIA PRESENTER



With a built-in laser pointer and trackball mouse, this presenter is ideal for doing presentations from your notebook.

P5884 **\$179**

WIRELESS CALCULATOR KEYPAD



Ideal for financial applications at home and on the road, this keypad provides a clean, uncluttered workspace.

P6592 **\$99**

PLEASE NOTE:

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THE WORLD LEADER IN SECURITY, FIREWALL AND VPN APPLIANCES

**Firebox® X500**

WG40500

Small businesses requiring an affordable, integrated security appliance with simple operation. Perfect for 20 - 100 users.

Rent* \$36.76/wk

M5787

\$2,999**Firebox® X700**

WG40700

Small businesses requiring an affordable, integrated security appliance that grows with their needs. Designed for 50 - 200 users.

Rent* \$36.31/wk

M5788

\$3,659**Firebox® X1000**

WG41000

Medium businesses requiring multi-layered security solutions with centralised management. Ideal for 200 - 500 users.

Rent* \$46.35/wk

M5789

\$4,899**Firebox® X2500**

WG42500

Medium or distributed enterprises requiring the utmost protection and remote connectivity. For organisations with more than 500 users.

Rent* \$67.28/wk

M5791

\$7,559***RENTSMART**

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**NEW**

back view



Firebox® X Edge, model-upgradeable VPN endpoints and SOHO firewall security appliances, deliver commercial-grade solutions that integrate perfectly with Firebox X to provide full, centralised management, logging, and historical reporting for securing telecommuter and remote offices. In addition, their intuitive user interfaces help small businesses with limited security expertise secure networks effortlessly.

FIREBOX EDGE	X5	X15	X50
MODEL UPGRADEABLE	YES	YES	YES
FEATURE UPGRADEABLE	YES	YES	YES
SERVICE UPGRADEABLE	YES	YES	YES
NETWORK INTERFACES	10	10	10
FIREWALL THROUGHPUT	80	95	100+
VPN THROUGHPUT	35	35	35
CONCURRENT SESSIONS	6,000	8,000	10,000
BO VPN TUNNELS	2	15	25
MU VPN TUNNELS	11	25	50
WAN FAILOVER	OPTIONAL	OPTIONAL	INCLUDED
USER LIMIT	5	15	UNLIMITED
RENT*	\$9.40/wk	\$11.37/wk	\$20.16/wk
PART NUMBER	P9512	P9522	P9532
PRICE	\$839	\$1,015	\$1,799

WEBBLOCKER:

Controls web access for users or groups, through a regularly updated database.

FIREBOX® X500
1-YEAR WEBBLOCKER SUBSCRIPTION
N0132 **\$719**
FIREBOX® X700
1-YEAR WEBBLOCKER SUBSCRIPTION
N0135 **\$999****SPAMSCREEN:**

Screens junk e-mail, reducing network traffic and increasing employee productivity.

FIREBOX® X500
1-YEAR SPAMSCREEN SUBSCRIPTION
M9352 **\$899**
FIREBOX® X700
1-YEAR WEBBLOCKER SUBSCRIPTION
N0134 **\$1,265**

Also available for X1000 & X2500. Please call Harris Technology for more information.

LINKSYS®

A Division of Cisco Systems, Inc.

harris technology



Networking

THE WORLDWIDE LEADER IN WIRELESS NETWORKING

WRT54G ROUTER + WPC54G ADAPTER BUNDLE

BUNDLE
ROUTER + ADAPTER
in 1 Wireless Internet Router, allows you to share your broadband connection wirelessly. 802.11G Wireless, 4 port 10/100 Ethernet Switch.



N0240 **\$239**

02.11 A/B/G TRI-BAND ADAPTER CARD - WPC55AG

The Linksys Dual-Band Wireless +G Notebook adapter lets your notebook communicate with all three wireless network standards. With one PC Card, you can connect to Wireless-A (802.11a), Wireless-G (802.11g) and Wireless-B (802.11b) networks.



N0252 **\$149**

WIRELESS-G PRINT SERVER OR USB 2.0 - WPS54GU2 - AU

Wireless 802.11G Print Server allows wireless printing directly to the print server without tying up a PC. Supports 1 X USB & 1 X parallel printer.



N8872 **\$329**

WIRELESS G NOTEBOOK ADAPTER SPEEDBOOSTER CARDBUS - WPC54GS

High-speed Wireless-G networking for your notebook computer, now with SpeedBooster performance enhancement, SpeedBooster technology increases Wireless-G performance by up to 35%. Also interoperates with standard Wireless-G and Wireless-B networks.



N7993 **\$155**

WRT54G ROUTER + WUSB54G ADAPTER BUNDLE

BUNDLE
ROUTER + ADAPTER
4 in 1 Wireless Internet Router, allows you to share your broadband connection wirelessly. 802.11G Wireless, 4 port 10/100 Ethernet Switch.



N0241 **\$249**

WIRELESS-G BROADBAND ROUTER - WRT54G

4 in 1 Wireless Internet Router, allows you to share your broadband connection wirelessly. 802.11G Wireless, 4 port 10/100 Ethernet Switch.



H9739 **\$165**

WIRELESS VPN BROADBAND ROUTER - WRV54G

The ultimate 802.11G wireless, security & remote access solution for your business. 802.11G Access Point with advanced SPI Firewall capability & 4 port 10/100 Switch, allows up to 50 VPN clients to remotely access your network.



L5961 **\$369**

WIRELESS G BROADBAND ROUTER SPEEDBOOSTER - WRT54GS

Complies with 802.11g and 802.11b (2.4GHz) standards. SpeedBooster technology increases wireless performance by up to 35%. Enhanced internet security management functions including internet access policies with time schedules.



N8988 **\$229**

802.11G 54MBPS WIRELESS-G PCI ADAPTER - WMP54G

Wireless-G (draft 802.11g) connectivity for your desktop PC. Up to 54Mbps in the 2.4GHz radio band. Interoperates with Wireless-B (802.11b) networks at 11Mbps.



H9737 **\$99**

PRINTSERVER FOR USB WITH 4 PORT SWITCH - PSU54

Also expands your network with a built-in 4 port 10/100 Ethernet switch. Remotely administered through your web browser or the included utility.



L7086 **\$125**

WIRELESS-G ACCESS POINT - WAP54G

802.11g 54Mb Wireless Access Point. Add wireless to your existing network. Supports WEP & advanced WPA wireless security.



H9736 **\$169**

5 PORT 10/100 SWITCH - SD205 8 PORT 10/100 SWITCH - SD208 16 PORT 10/100 SWITCH - SD216



L5968 **\$59**

L5969 **\$89**

L5970 **\$169**

WIRELESS G ADSL GATEWAY - WAG54G



- ADSL Modem with 4 x 10/100 switch ports
- Wireless 802.11G 54MB Access Point, supports both 11MB & 54MB clients
- Wireless Security includes WEP, WPA & 802.1x
- Powerful stateful packet firewall with denial of service attack prevention
- VPN Server, 5 VPN Tunnels - also supports VPN pass-through
- Remotely SNMP manage & upgrade firmware - perfect for corporate deployments
- 3 Year Exchange Warranty

M5307

\$249

WIRED ADSL GATEWAY - AG041

RECENT RELEASE



- ADSL Modem with 4 x 10/100 switch ports
- SPI Firewall with denial of service prevention
- VPN Server (5 Endpoints) & VPN pass-through
- SNMP Management, remote firmware download

N9123

\$179

PLEASE NOTE:

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SMART SWITCHES FROM NETGEAR

SMART SWITCHES!



Ideal for growing businesses, Netgear's Smart Switch Range deliver the benefits of management without the cost and complexity of a fully SNMP-capable network.

FS526T- 24 PORT 10/100 SMART SWITCH

24 10/100Mbps ports, 2 x copper Gigabit Ethernet ports, all ports are auto-netgating.

K8090 **Rent* \$6.37/wk**
\$569

FS750T- 48-PORT 10/100 SMART SWITCH

48 10/100Mbps ports, 2 x copper Gigabit Ethernet ports, ready to go out of the box.

N3143 **Rent* \$12.61/wk**
\$1,125

GS724T- 24-PORT SMART GIGABIT SWITCH

24 10/100/1000Mbps Gigabit ports, 2 x Small form factor pluggable (SFP) GBIC slots, easy browser based management.

N3147 **Rent* \$15.86/wk**
\$1,415

Check out www.netgear.com.au/warranty for full warranty options

*RENTSMART

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FSM7326P - POE L3 MANAGED SWITCH



24 10/100 ports + 2 gigabit ports. PoE on every port, full L2 and L3 management, dynamic routing and QoS capabilities.

Rent* \$24.50/wk

M3150 **\$2,369**

GS605- 5 PORT UNMANAGED GIGABIT SWITCH



5 10/100/1000Mbps Ethernet ports. Smart- honors 802.1p priority tags, great for VoIP applications.

GSM7324 - L3 MANAGED SWITCH



24 10/100/1000 ports + 4 small form-factor (SFP) slots, full L2 and L3 management, dynamic routing and QoS capabilities.

Rent* \$54.43/wk

J6587 **\$5,899**

GS116- 16 PORT 10/100/1000 GIGABIT SWITCH



16 auto-speed-sensing UTP network ports. Bandwidth: 32 Gbps (non-blocking) performance.

Rent* \$8.39/wk

P0140 **\$749**

FWG114P- CABLE/DSL PROSAFE WIRELESS ROUTER



11/54Mbps Firewall Router with USB print server. 2 VPN tunnels and 4 x 10/100 switch.

L2431 **\$365**

WAG511- 54 Mbps TRI BAND PC CARD



Wirelessly connect from your office, home or public access locations with a single card.

H9135 **\$169**

FVS318- CABLE/DSL PROSAFE FIREWALL ROUTER



8 VPN tunnels, Firewall, 8 x 10/100 switch, easy-to-use Web browser-based setup.

F0242 **\$255**

FWAG114- CABLE/DSL PROSAFE TRI-MODE WIRELESS VPN ROUTER



802.11a/b/g wireless LAN connectivity True Firewall routing with Stateful Packet Inspection (SPI) and Intrusion Detection.

J4686 **\$489**

FSM750S - L2 MANAGED SWITCH



48 10/100 ports + 2 built-in gigabit uplinks, 2 rear stacking ports stacks, SNMP, RMON, VLAN, QoS, port trunking. Non-blocking, auto negotiating Auto Uplink™.

Rent* \$21.28/wk

G4121 **\$1,899**

GS524T- 24 PORT 10/100/1000Mbps COPPER SWITCH



Cost-effective Backbone, 2000Mbps Full-duplex throughput over Cat 5 cables auto-detects speed gigabit switch.

Rent* \$14.22/wk

D5961 **\$1,269**

FVS328- PROSAFE VPN FIREWALL WITH DIAL BACK-UP



50 VPN tunnels, Firewall, L3 routing and 8 x 10/100 ports with dial backup for auto fail-over, negotiating, Auto Uplink™.

N0592 **\$339**

WG302- PROSAFE 802.11G WIRELESS ACCESS POINT



Netgear ProSafe 802.11g Wireless access point delivers enterprise-class performance and features to small and medium businesses.

L8310 **\$459**



NETGEAR™

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Networking

CONSUMER PRODUCTS

WG511T- 108Mbps WIRELESS PC CARD



Delivers up to 108Mbps to your notebook PC with Super G Technology (when used with the WG7624 router). PCI card also available WG311T.

L6030 \$119

WGT624- 108Mbps CABLE/DSL WIRELESS ROUTER



Super Fast! 108Mbps with Super G Technology, 4 x 10/100 switch, SPI and NAT firewall, 802.11b & 802.11g compliant, easy to install, 10 x speed and 4 x range of 802.11b wireless.

L6032 \$179

WG7634U- 108Mbps WIRELESS MEDIA ROUTER



Back up, share, and access your files wirelessly & remotely via USB disk drive or memory stick. 10 x speed and 4 x range of 802.11b wireless. PCI card also available.

N3193 \$259

WG111- 54Mbps WIRELESS USB ADAPTER



4Mbps standard 802.11g wireless Internet access 5x the speed of 802.11b. USB 2.0 powered up to 40x faster than USB 1.1.

N6536 \$149

WGR614- 54 Mbps CABLE/DSL WIRELESS ROUTER



4 port switch, 2.4 GHz, up to 253 users, True Firewall, SPI, URL control.

J2416 \$149

WG602- 802.11g 54Mbps WIRELESS ACCESS POINT



Simultaneously supports IEEE 802.11b & 802.11g std devices & networks. WEP encryption 128bit for both 802.11b and 802.11g devices.

H9579 \$195

G632 ADSL MODEM ROUTER PORT 10/100 SWITCH



All-in-one Modem, Router, and True Firewall with USB and Ethernet connectivity.

N6517 \$167

DG834- DSL MODEM ROUTER 4 PORT 10/100 SWITCH



All-in-one Modem, Router, and True Firewall with USB and Ethernet Connectivity.

L2610 \$209

DG834G- DSL MODEM/FIREWALL/ROUTER/54Mbps AP/SWITCH



ADSL modem, router, 4 port 10/100 Ethernet switch, 802.11g 54Mbps wireless access point and Firewall.

L2609 \$285

P614- WEBSAFE CABLE/DSL ROUTER & 4 PORT SWITCH



Lightning fast cable/DSL Internet sharing with integrated 4 port switch AT Firewall with VPN pass-through protects against hackers.

F9645 \$119

FR114P - PROSAFE CABLE/DSL AND PRINT SERVER



True firewall, delivering the ultimate in business class security features with integrated print server, web-based setup and configuration.

F0902 \$195

PS121- USB MINI PRINT SERVER



Connect all the PC's on the network to a USB printer. Quick and easy set up.

N9965 \$164

NETGEAR WGR614 & WG511 BUNDLE



WGR614 Cable/DSL Wireless Router 54Mbps/2.4 GHz

- Speeds of 802.11g - up to 5x faster than 802.11b
- 10/100Mbps on WAN
- Double Firewall - SPI & NAT
- Compatible with 802.11b devices
- Shares broadband Internet access
- Wi-Fi Protected Access Pre-Shared Key (WPA-PSK)
- Up to 128-bit WEP encryption

WG511 Wireless PC Card, BUS : 32bit

Q0913

\$219

MP101- WIRELESS DIGITAL MUSIC PLAYER



- Streams and plays MP3s and Windows Media format digital files from all of your networked PCs and Internet radio directly to your home stereo
- Remote control and vivid LCD interface for easy browsing of your music collection
- Listen through your stereo, boom box, headphones, or powered speakers
- Compatible with 802.11b or 802.11g wireless networks

N0441

\$275

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NETCOMM BROADBAND SOLUTIONS

**WIRELESS
ULTRA SERIES**
SINGLE
& 'TWIN'
PACKS

**54Mbps WIRELESS
PCI CARD**

NP542
P7567

\$69

'TWIN' PACK

54MBPS WIRELESS PCI CARD
NP542 (PACK2)

P5828

\$119

**54Mbps WIRELESS
PC CARD**

NP543
P8141

\$69

'TWIN' PACK

54MBPS WIRELESS PC CARD
NP543 (PACK2)

P6962

\$119

PLEASE NOTE:

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**ALL-IN-ONE ADSL MODEM
SWITCH + VPN/FIREWALL**
NB5580



The NB5580 is an intelligent ADSL solution designed for today's busy SMB or Home office wanting a robust, simple to install and configure all-in-one ADSL sharing solution.

L8436

\$229

**NB1300PLUS4W ADSL
MODEM/ROUTER &
NP7032 WIRELESS PC
CARD**



The NB1300PLUS4 Wireless combines an ADSL modem with USB and 10/100 Ethernet interfaces, Router, 4 port 10/100 Switch and 11Mbps Wireless Access Point. The NP7032 32-bit Wireless PC Card provides up to 11Mbps wireless network connectivity for notebook users.

BUNDLE NB1300PLUS4W + NP7032

P9089

\$199

**ADSL USB/ETHERNET
MODEM/ROUTER**
NB1300



NetComm's NB1300 with it's in-built ADSL 10/100 Ethernet Modem and Router delivers simultaneous ADSL services to local network users. The ADSL Router supports IP Packet routing and functions such as NAT and DHCP allowing users to have their IP address assigned automatically and share a single ISP account.

G4025

\$119

**ALL-IN-ONE ADSL MODEM
GATEWAY**
NB5580W



The NB5580W is an intelligent ADSL solution designed for today's busy SMB or Home office wanting a robust, simple to install and configure all-in-one ADSL sharing solution.

L8433

\$299

NB5

**NEW**

With support for ADSL2 and ADSL2+, the NB5 is the next generation ADSL modem/router. Powered by the latest TI chipset, the NB5 features an active firewall technology and is equipped with VPN pass-through for standard VPN client for point-to-point communication - even when the firewall is active. Other features include QoS (Quality of Service), port forwarding and UPnP. Best of all, when your ADSL service is upgraded to ADSL-2, you can upgrade your NB5 with a simple download.

P7335

\$179

**ADSL USB/ETHERNET MODEM/
ROUTER + 4 PORT SWITCH**
NB1300Plus4



Integrated NAT routing, built-in 4 port switch and fully compatible with all major Australian ISPs. Four click set-up with NetComm's unique Easy Config software tool. Deployable in Bridge (modem), PPP Half Bridge, Router, NAT router or NAPT Router. BONUS Microfilter included.

L2660

\$139



harristechnology



Networking

ENTERPRISE-CLASS PRODUCTS FOR THE SMALL BUSINESS

15 MINUTES AND YOU'RE IN BUSINESS WITH 3COM OFFICECONNECT®

ADSL WIRELESS 11g FIREWALL ROUTER

Combines an ADSL modem, router, 802.11g wireless access point, firewall and 4-port switch.



WIRELESS 108Mbps 11g XJACK PC CARD

108Mbps turbo mode provides speed up to 10 times faster than 802.11b networks.



NEW

P0041 **\$295**

P9245 **\$109**

WIRELESS 54Mbps 11g TRAVEL ROUTER

Provides the business traveller & SOHO with a 54Mbps wireless AP/Router, SPI/Firewall & WPA Security.



NEW

WIRELESS 54Mbps 11g PRINT SERVER

Compact size & web-based configuration makes setup easy. Compatible with most USB 2.0/1.1 printers.



NEW

P9246 **\$125**

P9244 **\$165**

GIGABIT TO THE DESKTOP

SUPERSTACK 3 SWITCH 3870

This 24-port 10/100/1000 Gigabit Ethernet switch combines wirespeed Layer 2 switching with stackability up to eight units high via a 40Gbps stacking architecture for impressive scalability—to 384 ports total. The hardware supports a 10-Gigabit expansion slot and is Layer 3-capable for investment protection. 24 auto-negotiating 10/100/1000 ports for seamless migration from Ethernet or Fast Ethernet to Gigabit Ethernet (48-port model also available).

Limited Lifetime Warranty



Rent* \$45.68/wk

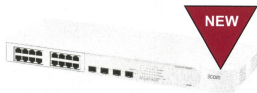
P0042 **\$4,829**

BEST NEW VALUE GIGABIT SWITCH FOR SMB NETWORKS

NEW 3COM BASELINE SMART SWITCH 2816-SFP PLUS

This unique product offers a ground breaking mix of industry leading, low price, great functionality and flexibility to small to medium business customers. The 2816-SFP is a smart, web-configurable, Gigabit Switch with 16 10/100/1000 ports and 4 SFP slots for fibre connectivity, supporting VLANs, link aggregation and much more.

Limited Lifetime Warranty



NEW

Rent* \$12.31/wk

P8807 **\$1,099**

3COM® SUPERSTACK® 3 SWITCH 3226 24 PORTS



Affordable, flexible layer 3 10/100 switching for workgroup 10/100 deployments needing the added benefits of layer 3 switching, the SuperStack 3 switch 3226 is the right solution.

Rent* \$10.25/wk

P0037 **\$915**

3COM® SUPERSTACK® 3 4226T SWITCH 26 PORTS



Affordable, high-performance, wire speed layer 2 10/100/1000 ethernet switching. Systems offer 26 port, built-in stacking, and gigabit ethernet and GBIC ports.

Rent* \$8.95/wk

F8996 **\$799**

3COM® SUPERSTACK® 3 SWITCH 4400 SE 24-PORT



High-performance 10/100 ethernet switching, with a choice of uplink options, QoS functionality, and full telephony support. SuperStack 3 switch 4400 PWR adds power over ethernet capability.

Rent* \$8.95/wk

E8249 **\$1,119**

*RENTSMART

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POWER BACK-UP EQUALS POWER PROTECTION

BIOPD
APC BIOMETRIC
PASSWORD
MANAGER

As security concerns continue to grow, so do the number of passwords. The Biometric Password Manager provides users a convenient and secure way to manage and access multiple security phrases and codes. This product reads and identifies users by their fingerprint and allows them to automatically access password protected applications and web sites.

P5698

\$99**PERSONAL SURGE ARREST
WITH TELEPHONE
PROTECTION**

A0098

\$89**BACK-UPS ES 350/500****BACK-UPS ES 350VA**

E1093

\$209**BACK-UPS ES 500VA**

E0709

\$295***RENTSMART**

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

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APC TRAVELPOWER CASE

This innovative and stylish carrying case, constructed of high quality materials, is designed to both protect and power your notebook computer, mobile phone and handheld. Connecting to a single air, auto or standard ac power outlet provides the power to charge and use all your devices. This integrated power system helps reduce weight and cord clutter since bulky transformer blocks and power adapters are no longer necessary. Carefully designed for convenience and durability, the APC TravelPower Case is the ideal choice for any mobile professional.

**FITS 15"
NOTEBOOKS****TRAVELPOWER CASE SMALL**

N1792

\$169**TRAVELPOWER CASE MEDIUM**

N7827

\$189**TRAVELPOWER CASE LARGE**

P6052

\$249**BACK-UPS RS FOR
WORKSTATIONS****Smart battery backup
& high performance
surge suppression**

Including additional outlet for protection of printers, audible alarms, phone/modem protection and user replaceable hot swappable batteries. PowerChute® Plus software.

Ideal for:

computer
& data**APC BACK-UPS RS 500VA**

H2003

\$395**APC BACK-UPS RS 1000VA**

J5134

Rent* \$9.52/wk

\$849**SMART-UPS USB WITH
POWERCHUTE PLUS****Power protection for mission-critical applications**

- LED status display with on-line, on battery, replace battery and overload indicators
- Auto Diagnostic Testing
- Automatic Voltage Regulation (AVR)
- CellGuard intelligent battery management
- Pager notification
- Network-grade line conditioning

**SMART-UPS 1000VA USB WITH POWERCHUTE PLUS**

D9337

Rent* \$14.52/wk

\$1,295**SMART-UPS 1500VA USB WITH POWERCHUTE PLUS**

D4218

Rent* \$19.00/wk

\$1,695

QUANTUM PROTECTS YOUR DATA & YOUR BUDGET!

QUANTUM PROTECTS THE WORLD'S MISSION-CRITICAL DATA WITH SIMPLE, SCALABLE BACKUP SOLUTIONS FROM THE DESKTOP TO THE DATA CENTRE

DLT TAPE™ DRIVES AND MEDIA Providing scalable performance coupled with backward-read compatibility to protect existing investments, the DLT tape range is designed for small-to-medium sized enterprises.

DLT VS80 - QUANTUM DLT VS80 BARE INTERNAL TAPE DRIVE

LVD/SE SCSI interface. Mounting screws, quick install/start guide, warranty card, colour is beige. Black colour available.

External version available.



Rent* \$19.04/wk

N3110 **\$1,699**

DLT VS160 - QUANTUM DLT VS160 BARE INTERNAL TAPE DRIVE

LVD/SE SCSI interface. Mounting screws, quick install/start guide, warranty card, colour is beige. Black colour available.

External version available.



Rent* \$26.79/wk

N3114 **\$2,699**

SDLT 320 - QUANTUM SDLT 320 INTERNAL LVD SCSI

Internal mount SCSI 160 interface. CD, SDLT Docs & software, quick install/start guide, SCSI jumpers, Quantum super DLTape I media cartridge. Colour is beige. Black colour and external version available.



Rent* \$53.52/wk

F3197 **\$5,799**

SDLT 600 - QUANTUM SDLT600 INTERNAL DRIVE

Internal mount SCSI 160 interface. CD, SDLT Docs & software, quick install/start guide, SCSI jumpers, Quantum super DLTape II media cartridge. Colour is beige. Black colour and external version available.



Rent* \$72.09/wk

N3117 **\$8,099**

-SERIES AUTOLOADERS

The ValueLoader™ brings tape automation to the smaller business at the price of a stand-alone tape drive.

The award-winning SuperLoader™ eliminates the compromise between capabilities and cost by providing enterprise-class features, reliability and capacity at a low cost per GB. Call for DLT VS160, LTO-1, LTO-2, SDLT 320 and SDLT 600 versions.

QUANTUM VALUELOADER WITH DLT VS80

Up to 320GB native capacity, 1MB per second compressed performance. Wide Ultra SCSI-2 LVD interface. External version available.



Rent* \$55.36/wk

N6758 **\$5,999**

BONUS iPod BEFORE 30/11/04#

QUANTUM SUPERLOADER WITH SDLT320

Up to 2.5TB native capacity, 32MB per second compressed performance. Wide Ultra SCSI-2 LVD interface.



Rent* \$137.30

N5401 **\$16,999**

BONUS iPod BEFORE 30/11/04#

M1500 - QUANTUM M1500SX TAPE LIBRARY
Native capacity for SDLT 600 of 6.3TB at 36MB/s native transfer rate. Base-library configurable from zero to two drives and up to 25 cartridge slots. Supports SDLT 320, SDLT 600, and LTO-1™, and LTO-2™ tape drives. Drivesless configuration available for "capacity-only" scalability. Stack ten, manage as one.



Rent* \$158.48/wk

M3880 **\$19,699**

M2500 - QUANTUM M2500 TAPE LIBRARY

Base-library configurable from zero to six drives and 100 cartridge slots. Drivesless configuration available for "capacity-only" scalability. Supports SDLT320, SDLT600, LTO-1™, and LTO-2™ tape drives. Stack three, manage as one.



N8933 **\$39,999**

QUANTUM DLT VS80 RACKMOUNT, SINGLE DRIVE. QUICK INSTALL.



Quantum DLT VS80 Rackmount, Single Drive. Quick Install/Start Guide, Warranty Card, power cord, mounting hardware, shunt jumper, SCSI cable.

Rent* \$24.65/wk

N3112 **\$2,199**

QUANTUM TAPE MEDIA

DLT TAPE IV

CompactTape IV (20/40, 35/70 & 40/80GB) DLT Tape

71231 **\$69**

QUANTUM SDLT1

SDLT1 Tape (110/220GB & 160/320GB)

B9825 **\$105**

QUANTUM SDLT2

Media for the SDLT600

N4918 **\$199**

BONUS IPOD BY REDEMPTION FOR DETAILS VISIT

www.quantum.com/am/products/al/Special_Offers/iPod_promotion_apac.htm
FOR FULL DETAILS.

BONUS iPod

QUANTUM WARRANTY

Available for all models. 3-Year Rapid Exchange Warranty with Telephone & Online Support. On-site installation and on-site service optional.

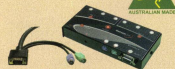
*RENTSMART

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INTELLIGENT KVM SOLUTIONS

SERVERLINK SOHO
KVM SWITCHESSL-251-P 2 PORT
KVM INC. 2 X 2M CABLESE3692 **\$199**SL-451-P 4 PORT
KVM INC. 4 X 2M CABLESE3694 **\$299**SERVERLINK INFINITY
KVM SWITCHESSL-221
2 port ServerLink KVM for PS2
B3047**\$259**SL-421
4 port ServerLink KVM for PS2A9890 **\$345**SL-821
8 port ServerLink KVM for PS2

Rent* \$10.53/wk

97888 **\$939**SL-1621
16 port ServerLink KVM for PS2

Rent* \$17.65/wk

97890 **\$1,575**

*RENTSMART

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SERVERLINK STAR KVM SWITCH



CONTROL TWO PCS FROM ONE CONSOLE

- Compact in size cables attached
- Select computers with easy hotkey commands

M2084 2 PORT SERVER LINK STAR **\$75**SERVERLINK LCD KVM RACK
DRAWER

15" TFT FLAT PANEL

USB MODELS ALSO AVAILABLE Rent* \$28.67/wk

H2101 8 PORT PS/2 - 15" LCD **\$2,889**

Rent* \$33.74/wk

H2103 16 PORT PS/2 - 15" LCD **\$3,399**SWITCHVIEW KVM
& IP ACCESS
BUNDLE

UPGRADE YOUR KVM TODAY

- BIOS Level access to servers via TCP/IP
- Includes 8 port SwitchView KVM, 8 x PS/2 Cables, Rack mount kit & SwitchView IP Remote Access Device

AVOCENT 8 PORT
SWITCHVIEW IP BUNDLE Rent* \$19.60/wkP9196 **\$1,749**

SERVERLINK ELITE KVM SWITCHES

RECENT
RELEASE

8 & 16 PORT 1U HIGH DENSITY SWITCHES

- On-screen display for simple management
- Supports video resolution up to 2048 x 1536

Rent* \$6.15/wk

N6589 8 PORT ELITE KVM **\$549**

Rent* \$7.84/wk

N8989 16 PORT ELITE KVM **\$699**SERVERLINK LCD KVM RACK
DRAWER

17" TFT FLAT PANEL

USB MODELS ALSO AVAILABLE Rent* \$34.72/wk

N9128 8 PORT PS/2 - 17" LCD **\$3,499**

Rent* \$39.43/wk

N9129 16 PORT PS/2 - 17" LCD **\$3,999**

KVM OVER CAT 5 BUNDLE



REDUCE CABLE CLUTTER AT THE RACK

- Supports PS/2, SUN, USB or serial computer via Cat 5 RJ45 UTP Dongles
- 16 port KVM, 8 x PS/2 Dongles and rack mount kit

AVOCENT 16 PORT
CAT 5 BUNDLE Rent* \$22.32/wkN5089 **\$2,249**

USB - STORAGE & CONNECTIVITY

USB 2.0 MINI DRIVE 2.2GB

RECENT RELEASE



UMD-022
Store up to 2.2GB of data with this ultra compact 1 inch hard disk drive that plugs directly into your USB port.

P2357 **\$329**

USB 2.0 QUICKLINK 5-IN-1 CABLE

NEW



USB2-QL-02
QuickLink connectors for all your USB devices and a 2 metre cable.

P9191 **\$29**

USB 2.0 FLASH DRIVES

HOT PRICE



L2374	32MB	\$39
L2375	64MB	\$45
L2377	128MB	\$69
L2378	256MB	\$99
L2379	512MB	\$199
L2381	1GB	\$399

USB TO PS/2 ADAPTER



UKMC-100 USB to PS/2 Keyboard & Mouse Adapter.

B0557 **\$35**

USB SERIAL CONVERTER



UMC-100 USB 9 Pin Serial Adapter.

80782 **\$55**

USB 2.0 DOCKING STATION



UDS-122 USB 2.0 Docking Station Includes: 10/100 Ethernet.

N0922 **\$149**

IEEE1394 FIREWIRE PCI CARD



1394-PCI 3 port IEEE1394 FireWire PCI card.

D8946 **\$45**

USB 2.0 PCI HOST ADAPTER



UPCI-502 5 port USB 2.0 PCI controller card.

N2275 **\$39**

USB 2.0 HDD 2.5" IDE ENCLOSURE 3.5" also available



UHD-2502 USB 2.0 2.5" IDE Enclosure.

N0959 **\$69**

FIREWIRE CARDBUS ADAPTER



1394-301 3 port FireWire Cardbus.

N2272 **\$59**

USB 2.0 CARDBUS ADAPTER



UCB-202 2 port USB 2.0 Cardbus.

N2270 **\$59**

USB & FIREWIRE COMBO CARDBUS



UFCB-402 4 port USB 2.0 and FireWire Combo CardBus.

P2062 **\$99**

USB 2.0 HUBS

USB 2.0 hub allows you to add multiple high-performance USB 2.0 peripherals to your PC or MAC.

4 PORT USB 2.0 POCKET HUB


N2301 **\$55**

4 PORT USB 2.0 DESKTOP HUB


N2302 **\$55**

USB TO IRDA INFRARED ADAPTER



Enabling IrDA wireless data communication through a standard USB port.

N0930 **\$69**

PLEASE NOTE:

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NETWORKING SOLUTIONS

DFL-700 FIREWALL



The new DFL-700 network security appliance is an easy-to-deploy VPN and firewall solution designed for small to medium businesses that demand superior performance and security. This appliance provides integrated Network Address Translation (NAT), SPI Firewall, advanced content filtering features, IDS protection, bandwidth management, as well as Virtual Private Network (VPN) support. The DFL-700 hardware includes a trusted LAN port, a WAN port that supports virtually all WAN connection types, and an independent DMZ port to support local servers such as e-mail, Web, and FTP. Supports up to 200 VPN tunnels.

Rent* \$11.19/wk
\$999

P5967

WHAT IS THE WEBSMART SWITCH?

The Websmart switch provides manageability at the price of an unmanaged switch.

What the WebSmart Switch provides:

- Web based configuration
- Port based VLAN
- Port trunking
- Port based QoS
- Port mirroring
- Port setting for speed, duplex mode or status of flow control. Auto-discovery utility will find all D-link Web Smart Switches on the network. Ideal for the small office that requires the ability to make changes to their network without the requirement of a fully manageable switch.

*RENTSMART

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DI-824VUP+ WIRELESS VPN ROUTER FOR DSL/CABLE

- Wireless 802.11g Cable/DSL VPN Router with 4 port Switch & Parallel/USB Print Server
- Up to 40 VPN tunnels to 40 remote sites
- DoS, SPI, packet filtering firewall protection
- RS-232 COM port for ISDN or 56Kbps analog modem backup



N0963

\$299

DWL-G120 WIRELESS LAN USB ADAPTER

- Up to 54Mbps, increased security with WPA1
- 802.11g standard,
- 802.11b compatible



P3057

\$145

DGS-1008TL 8-PORT 10/100/1000Mbps GIGABIT SWITCH

- 16GBPS SWITCHING CAPACITY
- RACK MOUNTABLE OR DESKTOP
- NON-BLOCKING ARCHITECTURE



- Gigabit Ethernet switch
- 8 port 10/100/1000Mbps Switch
- Transfer graphics, CGI, CAD, or multimedia files across the network instantly.
- The versatile and compact 1U height design of the DGS-1008TL enables the device to be rack-mounted in a standard 19 inch rack, while conserving valuable rack space.
- 802.1p priority queues, port-based QoS
- IEEE 802.3x flow control
- Configuration through web-based management
- Auto MDI/MDI-X on all ports, eliminating the need for crossover cables or uplink ports

L7850

\$419

DWL-G122 11 / 54Mbps WIRELESS LAN USB KEY

- D-Link AirPlusG+TM 11 / 54Mbps
- Wireless LAN USB Key
- USB 2.0, 802.11g: up to 54Mbps
- 802.11b: up to 11Mbps, 2.4 Freq



P3058

\$139

DSL-G604T WIRELESS ADSL ROUTER & 4 PORT SWITCH

- 4 port Fast Ethernet & 802.11g wireless connectivity
- Supports WPA security
- Secure NAT/DHCP functions
- Telstra approved
- Supports all major ISP's
- Free microfilter included



P3062

\$219

DGS-1216T 16-PORT 10/100/1000Mbps COPPER GIGABIT WEBSMART SWITCH WITH 2-PORT COMBO MINI GBIC



- WebSmart gigabit ethernet switch
- 16 x 10/100/1000Mbps auto-negotiating ports
- 2 x Combo Mini GBIC Ports
- Auto-negotiation of MDI-II / MDI-X cross over for easy expansion
- Port trunks (aggregation) for server / network backbone connections
- Port-based VLAN support to enhance security / network performance
- 802.1p priority queues, port-based QoS
- IEEE 802.3x flow control
- Configuration through web-based management
- 19" rackmount installation
- Includes NetProtect standard (10x5x8) - 1 Year onsite maintenance (Australia only)

Rent* \$10.63/wk

N1045

\$949

WIRELESS BROADBAND SOLUTIONS

DWL-G650 11/54/108Mbps WIRELESS LAN PCMCIA Card



This adapter supports high-speed wireless networking of up to 108Mbps, while providing seamless interoperability with all existing 802.11b and 802.11g wireless equipment. Together with better security, this adapter is the ideal wireless solution that offers an upgrade to a fast, new technology while protecting your past investments through interoperability with your current network equipment.

H9621 **\$109**

DWL-G520 11/54/108Mbps WIRELESS LAN PCI ADAPTER



This adapter supports high-speed wireless networking of up to 108Mbps, while providing seamless interoperability with all existing 802.11b and 802.11g wireless equipment. Together with better security, this adapter is the ideal wireless solution that offers an upgrade to a fast, new technology while protecting your past investments through interoperability with your current network equipment. Antenna is detachable.

H9622 **\$129**

DWL-302G USB/ETHERNET COMBO ADSL MODEM

Plug in and connect to the Internet at speeds up to 200 times faster than dial-up.

Plug + play
USB installation
Support
2 computers
simultaneously



J2428 **\$125**

DWL-810+ AIRPLUS ETHERNET TO WIRELESS CONVERTER

Converts virtually any Ethernet device to a wireless network device

- ie. Set top box, game console, printer & PC
- Features 256-bit WEP encryption for a higher level of security



Up to
22
Mbps!

J2433 **\$139**

DWL-2100AP 11/54/108Mbps WIRELESS LAN ACCESS POINT WITH SIMULTANEOUS BRIDGING

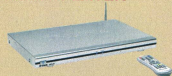
Up to
108
Mbps!



- 11 / 54 / 108Mbps wireless LAN access point/bridge
- 10/100Mbps fast ethernet interface for connecting to wired network
- IEEE 802.11g standard & downward compatible with IEEE 802.11b
- WDS (Wireless Distribution System)
- Autosenses & adjusts speed to conditions for maximum performance
- 64-/128-/152-Bit Wired Equivalent Privacy (WEP) security support
- WiFi protected access (WPA)
- Support for IEEE 802.1x Security
- SNMP Management
- DHCP Server / Client
- Configuration & management via web browser
- Replaceable antenna with reversed SMA connector for extending wireless range

N6053 **\$215**

DSM-320 WIRELESS MEDIA PLAYER



- Play music, videos and display photos
- Stream media content from your PC to your Entertainment center
- Listen to digital music on your stereo system
- View digital photos, slideshows and video on TV
- Remote controlled TV interface for quick access to your media content
- Connects wirelessly using 802.11g or via ethernet

P0414 **\$389**

DI-624 11/54/108 Mbps WIRELESS ROUTER



Connects up to 20 computers without wires and up to 4 computers with wires to share the Internet, swap files and share a printer on a wireless network.

- Advanced firewall & parental control
- Easy installation
- 802.11g, 802.11b compatible
- Increased security with 802.1x and WPA

J4539 **\$215**

*RENTSMART

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SONY VIDEOCONFERENCING

CTE600



High performance audio unit designed to provide crisp high-fidelity speech reproduction for distance meetings.

Rent* \$17.25/wk

P9643

\$1,539

PCSDSB1



Send and receive data in native XGA resolution from your PC using the Data Solutions Box.

Rent* \$24.81/wk

L6665

\$2,399

PCSSTP1

Pillar type stand for PCS11 / 1P. Designed to mount the camera when being used in conjunction with plasma or projector.



Rent* \$19.04/wk

L6673

\$1,699

*RENTSMART

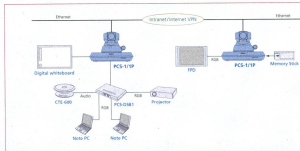
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In today's competitive business environment, videoconferencing becomes a tool to provide quicker decision making while saving travel time and expense. It enables companies to conduct face-to-face meetings immediately, enabling increased productivity and efficiency.

Sony's range of group videoconference systems bring the benefits of near broadcast quality video, clear audio and ease of use to your organisation to enhance the way your business communicates.



PCS11P

The PCS11P is an affordable high performing videoconference system designed for small to medium business markets, whilst equally suited for the enterprise branch office or education market.

Based on the state of the art technology of the PCS1P, the PCS11P boasts the same high quality video and audio; in addition to networking capabilities and encryption. The PCS11P provides excellent value for money.

- Near broadcast video quality
- Up to 1Mbps over IP or 768kbps over ISDN
- Providing higher quality video at the same bandwidth
- Data Receiving capabilities in real time.
- Great networking capabilities with built in QoS
- AES encryption for secure videoconference meetings over IP
- Memory stick support for sharing photos, presentations and upgrading software



Rent* \$59.63/wk

N6256

\$6,699

PCS1P

Designed for small to medium sized meeting rooms, the PCS1P offers a variety of choices to incorporate presentation material and can be upgraded to connect up to six sites.

Share PC or handwritten material through the Data Solutions Box and PCS1P in real time to remote sites for faster more succinct presentations without spending additional time faxing information.

Communicate with all your branch offices or customer site by connecting up to six sites using a combination of ISDN or IP connections with the

- Near broadcast video quality
- Up to 2Mbps over IP or 768kbps over ISDN
- Providing higher quality video at the same bandwidth
- Data sharing capabilities in real time / native resolution
- Great networking capabilities with built in QoS
- AES encryption for secure videoconference meetings over IP
- Memory stick support for sharing photos, presentations and upgrading software



Rent* \$72.98/wk

L6409

\$8,199

CORDLESS AND OPTICAL COMBINATIONS

CORDLESS DESKTOP® MX™

 Bluetooth



Logitech's Cordless Desktop MX for Bluetooth is a premium Bluetooth keyboard, rechargeable optical mouse, and Bluetooth wireless hub combination that maximises freedom, precision, and usefulness for other Bluetooth devices. 5 year warranty.

DINOVO MEDIA DESKTOP

 Bluetooth



Logitech's diNovo Media Desktop is a dramatically designed Bluetooth keyboard and MediaPad, rechargeable optical mouse, and Bluetooth wireless hub combination that transforms the user's work space. The included Bluetooth wireless hub makes your PC Bluetooth, letting you do voice instant messaging with a Bluetooth headset and exchange data between your Bluetooth PDA, mobile phone, printer and your PC. 5 year warranty.

QUICKCAM EXPRESS



K8501

\$66

QUICKCAM IM



N9485

\$95

QUICKCAM PRO 4000



F8835

\$199

LOGITECH MARBLE MOUSE



B7946

\$48

TRACKMAN WHEEL



C3688

\$62

CORDLESS TRACKMAN WHEEL



A2157

\$99

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L3807

\$299

NOTEBOOK OPTICAL MOUSE PLUS

is the simplest, most durable notebook mouse available. When you're ready to move, Logitech's patent-pending, integrated cord-wrap feature enables you to wind the cord neatly into the mouse for easy packing. Shock-resistant bodywork withstands bumps on the road, while the smooth, rounded shape provides the perfect balance of comfort and mobility. USB. 3 year warranty.



NEW!

N1740

\$49

LOGITECH X-230 SPEAKERS



NEW!

Crank up the PC audio with Logitech's X-230 speaker system. The ported subwoofer features a dynamic, real-time equaliser that maximises punch while minimising distortion for pounding bass. Satellites are wall-mountable. 2 years warranty.

P3348

\$95

L6329

\$399

LOGITECH CORDLESS OPTICAL MOUSE BLACK

Enjoy freedom from snagged and tangled mouse cords with the Logitech Cordless Optical Mouse. Setup is a breeze - just plug the receiver into your PC or Mac and you'll be ready to go. The receiver can be hidden out of site, and its reliable cordless technology works within a 2 metre range so you're free to move about your desk.



N1387

\$50

LOGITECH X-530 SPEAKERS



NEW!

Pump up your PC audio with Logitech's X-530 speaker system. The ported subwoofer features a dynamic, real-time equaliser that maximises punch while minimising distortion for pounding bass. Matching front and rear satellites deliver balanced surround sound. The X-530 speaker system also has convenient volume and subwoofer level controls. Use the headphone jack for private listening. Satellites are wall-mountable. 2 years warranty.

P3349

\$145

BELKIN SURGE PROTECTION, CASE AND KVM SOLUTIONS

SURGE PROTECTION
BONUS!!

Buy 3 units of the 5-, 6-, 7-, or 8-way Surge Boards and get the Fourth Surge Board (of the same type) at no extra charge! Please note: offer does not include SurgeCubes or 4-outlet surge boards. All 4 boards must be of the same type. Offer extended to 31 Oct 2004.

SURGEMASTER® SUPERIOR
SERIES SURGE
PROTECTOR

The Superior Series is perfect for mid-level to advanced computers, inkjet printers, ADSL modems, audio video and Ethernet networks.



6 Way	
N3366	\$139
5 Way (Tel, RJ45)	
N3362	\$139
6 Way (Tel, Audio, Visual)	
N3367	\$149

SURGEMASTER® GOLD SERIES
SURGE PROTECTOR

The Gold Series is perfect for professional workstations, laser printers, broadband modems, home theatre systems and Ethernet networks.



8 Way (Tel, Audio, Visual)	
N3353	\$179
7 Way (Tel, Audio, Visual, RJ45, F-type)	
N3349	\$189
7 Way (Tel, Audio, Visual, RJ45)	
N3351	\$199

RENTSMART

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NEU ELEMENTS - CASE SOLUTIONS FOR YOUR NOTEBOOK

Every case has been designed and manufactured to the ultimate standards in comfort, protection and durability. Smart storage features have been introduced, with more pockets and holders in every bag. All of our cases come with Belkin's Lifetime Warranty.

*Bonus extended for the month of October, applicable to all Neu Elements cases only.

NE-17 NOTEBOOK CASE FOR 17" NOTEBOOKS

- Reinforced Honeycomb Frame
- Provides shock damage protection with high-density foam



P0247	\$99
-------	-------------

NE-07 NOTEBOOK BAG

- Lightweight design, top loading convenience
- Super soft shoulder strap for ultra comfort
- Pen, disk and accessories storage



L4287	\$59
-------	-------------

NE-L01 EXECUTIVE SERIES LEATHER CASE

- Stylish lines and sturdy construction
- Fine grade leather exterior crafting
- Ergonomic shoulder strap



L4280	\$104
-------	--------------

FREEPORT II BACKPACK

- Padded external support panel for back and shoulder cushioning
- Removable padded computer sleeve



L4274	\$75
-------	-------------

NE-TR NOTEBOOK TROLLEY

- Ergonomic shoulder strap and soft, sturdy handle for easy lifting
- Telescoping extendable handle



L4291	\$159
-------	--------------

NE-TL2 TOP-LOADING XL CASE

- Lightweight, durable honeycomb constructed frame
- Professional, stylish look



L4284	\$96
-------	-------------

KVM SOLUTIONS

KVM (PS/2 keyboard, VGA video, PS/2 mouse) switches and accessories allow you to control multiple computers from one console (keyboard, video, mouse). KVM switches are a cost effective and space saving alternative to having one console for each computer. Belkin offer a specific KVM device for every need from SOHO applications to enterprise networks.

BELKIN 2 PORT KVM SWITCH

With built in cabling

L6584	\$76
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BELKIN ECONOMY 2 PORT KVM

With cables attached, PS/2 & Audio Support

N5955	\$99
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BELKIN OMNIVIEW 2 PORT

Reverse KVM Switch with 1 x all in one cable set

C4662	\$179
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BUNDLED BONUS CABLES WITH ENTERPRISE KVM!

OFFER EXTENDED 31 OCT 2004



- Provides multi-level security for added protection of connected servers
- Enables expandability without losing a port with dedicated daisy-chain ports
- Includes the powerful yet easy-to-use IntelliView Graphical On-Screen Display (OSD) for extensive control over connected servers
- Offers cross-platform support for USB and PS/2 interfaces
- Supports video resolutions of up to 2048x1526@65Hz

8 KVM SWITCHES	USB	PS2
RENT*	\$11.75/wk	\$11.75/wk
PART	N6096	N6098
PRICE	\$1,049	\$1,049

16 KVM SWITCHES	USB	PS2
RENT*	\$15.45/wk	\$15.45/wk
PART	N6099	N6100
PRICE	\$1,379	\$1,379

8 x2 KVM SWITCHES	USB	PS2
RENT*	\$12.99/wk	\$12.99/wk
PART	N6141	N6142
PRICE	\$1,159	\$1,159

16 x2 KVM SWITCHES	USB	PS2
RENT*	\$16.80/wk	\$16.80/wk
PART	N6143	N6144
PRICE	\$1,499	\$1,499



i n v e n t

harris technology

Projectors

HP DIGITAL PROJECTORS

WITH SLEEK CURVES, CHIC STYLE, SOPHISTICATED LOOKS AND STATE-OF-THE-ART TECHNOLOGY - YOUR VIEW OF DIGITAL PROJECTORS WILL CERTAINLY NEVER BE THE SAME!

Leave your audience speechless with HP digital projectors' stylish design, superb colour rendition, excellent contrast, true-to-life image projection and simplicity to use. Whether presenting in or out of the office or relaxing at home with a DVD, HP's range is the perfect solution.

Visit www.hp.com.au/promotions for your current Projector Promotional offer.

HP MP3130 DIGITAL PROJECTOR

The sophisticated mp3130 digital projector is the only vertical projector in Australia. Powerful zoom, keystone picture correction (vertical and horizontal) and the ability to be wireless (optional module and LAN card required) gives you the convenience of projecting an image from anywhere in the room.

- DLP™ technology
- 1800 lumens in brightness
- XGA
- High 1800:1 contrast ratio
- Zoom lens
- Integrated speaker
- Extremely portable at 1.5kg
- 4000 hour lamp life (eco mode)
- Carry bag included
- 3 years (unit exchange) warranty

TRIAL OFFER!

See side bar for details



Rent* \$38.44/wk

L3520

\$3,899

HP SB21 DIGITAL PROJECTOR

The SB21 digital projector is easy to use, weighs just 1kg and fits in the palm of your hand. Perfect for the home with its extremely high contrast and perfect for any individual who travels frequently.

- DLP™ technology
- 1000 lumens in brightness
- SVGA
- High 1800:1 contrast ratio
- Extremely portable at 1kg
- Carry bag included
- 2 years (unit exchange) warranty

TRIAL OFFER!

See side bar for details



Rent* \$23.52/wk

G8845

\$2,099

VERSATILE HP VP6110 DIGITAL PROJECTOR

Perfect for Serious Home Theatre or Entry Level Conference Room. HP's high contrast will bring out the best in your DVDs.

- DLP™ technology
- 1500 lumens in brightness
- SVGA

- High 2000:1 contrast ratio
- Picture-in-Picture feature
- Integrated 3-watt speaker
- Lamp Saver mode (3000 hours)
- 2.9kg
- 2 year (unit exchange) warranty



Rent* \$22.94/wk

K1729

\$2,315

VERSATILE HP VP6120 DIGITAL PROJECTOR

Perfect for the Conference Room with HP's impressive brightness, image quality and XGA resolution.

- DLP™ technology
- 2000 lumens in brightness
- XGA

- High 2000:1 contrast ratio
- Picture-in-Picture feature
- Integrated 3-watt speaker
- Lamp Saver mode (3000 hours)
- Ceiling mountable/portable 2.9kg
- 2 year (unit exchange) warranty



Rent* \$30.71/wk

K1736

\$2,994

HP MP3222 DIGITAL PROJECTOR WITH ADVANCED DLP™ TECHNOLOGY

The mp3222 has picture quality consistently more durable and longer lasting than LCD type projectors! Additional image optimisation selector optimises your display for data or video input by selecting the best colour contours and contrast levels for your presentation at push of a button.

- DLP™ technology
- 2000 lumens in brightness
- XGA
- High 2000:1 contrast ratio
- Integrated speaker
- 1.7kg - carry bag included
- 3 years (unit exchange) warranty



Rent* \$29.74/wk

P7947

\$2,899

NEED A PROJECTOR FOR AN UPCOMING PRESENTATION OR OFFICE EVENT?

TRIAL A CURRENT MODEL HP PROJECTOR FOR LESS THAN \$50 A DAY!*

If you're considering investing in a projector for your business or home, why not trial one first with HP? HP's projector range is designed to achieve real power, supreme image quality and maximum portability. Whether you're looking at a model for permanent installation or a sleek and light-weight design that's perfect for the frequent business traveller, we can offer you a trial projector for your presentation. Make a bright and bold impression at home, in the office or on the road when you trial an HP projector for \$49 a day.* Email projectortrial@dgwarehouse.com to make a booking or visit www.hp.com.au/promotions for more details.

*\$49 cost includes GST. Minimum trial of 2 days and maximum trial of 7 days, with the trial period to be agreed by both parties. Customer is required to reimburse HP the costs of the courier (to and from customer's site), insurance and handling. These costs are \$49 per day for the first 7 days, and \$99 per day thereafter. This introductory offer is available once per business or household only. Offer valid until 11 November 2004 and is subject to availability. Customer is required to enter into HP's Loan Agreement.

*Information regarding DLP™ technology provided by Texas Instruments from research conducted by the Munsell Colour Science Laboratory (MCSL) at the Rochester Institute of Technology.

RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

VISUAL DISPLAY OF CHOICE

DIGITAL/ANALOGUE MONITORS

21.3" TFT MONITOR



SYNCMASTER 213T

- Viewable image size: 21.3"
- Brightness (typical): 250 cd/m²
- Contrast ratio: 500:1
- Analogue/digital interface
- Colour: Silver
- Special features: narrow-bezel design, pivot technology/height adjustable, dual interface

Rent* \$27.25/wk
\$2,635

J2605

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

17" DIGITAL/ANALOGUE TFT



SYNCMASTER 173P

- 1280 x 1024 resolution
- Pixel pitch: 0.264 (mm)
- 700:1 contrast ratio
- Brightness: 270 cd/m²
- Response time: 25ms
- Analogue/digital interface
- Power (On-Mode): 40 Watts (Maximum)
- Dual hinge with pivot
- Height adjustment

Rent* \$11.08/wk

N9029

RED

\$989

19" LCD MONITOR



SYNCMASTER 910T

- 1280 x 1024 resolution
- 1000:1 contrast ratio
- 170° H/V viewing angles
- Height adjustable
- Digital/Analog dual inputs
- Narrow bezel
- Pivot technology

Rent* \$13.28/wk

P2937

\$1,185

17" MULTIFUNCTION WIDE LCD



RECENT RELEASE

SYNCMASTER 730MW

- Brightness 450 cd/m²
- Contrast Ratio 500:1
- Digital/Analogue Interface
- Multimedia Speakers: 5Watt
- Other include accessories: Remote control
- Weight Net 6.15kg
- Special Features: Integrated TV Tuner, S-video, HDTV ready, PIP function (Auto POP-Up), MagicBright
- Stand: foldable stand

Rent* \$15.68/wk

P5689

\$1,399

40" TFT WIDE DUAL INTERFACE



SYNCMASTER 403T

- 40" TFT Wide Format
- Silver, Dual Interface
- Speakers
- Desk Stand
- Contrast Ratio 600:1
- Response time: 23ms

Rent* \$75.42/wk

J2678

\$8,995

WIDESCREEN LCD TECHNOLOGY

EPSON PRINTERS

EPSON STYLUS PHOTO R310

- 15ppm black
- Print directly from a wide range of Digital Cameras using the new PictBridge printing standard
- Dedicated memory card slot
- True BorderFree printing - up to A4!
- Print directly onto the surface of inkjet printable CDs
- 6 individual colour ink cartridges for economical printing



M5315 **\$369**

EPSON ACULASER C1900 COLOUR LASER

- High performance colour laser for professional workgroups
- 16ppm monochrome; 4ppm colour
- Up to 200 sheets of EPSON Color Laser Paper, plain paper and recycled
- Parallel and USB
- Windows and MAC platforms



Rent* \$12.87/wk

G8715 **\$1,149**

EPSON PICTUREMATE



THE EASY TO USE PERSONAL PHOTO LAB FOR THE HOME USER

EPSON makes creating photos from your digital camera simple, cost effective and convenient. With the EPSON PictureMate, creating lab-quality, highly durable, glossy photos has never been easier. And for less than 50 cents per photo, creating photos at home has never been more affordable!

- Lab quality 100 x 150mm border free photos without the need for a computer
- Support for most available digital camera memory cards (Compact Flash, Smart Media (Max 128MB), Memory Stick, Magic Gate Memory Stick PRO, Memory Stick Duo, Microdrive, SD Memory Card, Mini SD Card, MultiMedia Card, xD Picture Card)
- Individual ink cartridges
- EPSON UltraChrome ink - featuring new red and blue ink for brighter photos
- Print photos directly from your PictBridge compatible digital camera
- Print directly from Bluetooth compatible mobile camera phones with the optional Bluetooth adaptor

P1646

\$359

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

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EPSON STYLUS PHOTO R800

- 5760 x 1440 optimised dpi using RPM technology
- Up to 17ppm for black text A4 (memo) printing
- BorderFree printing
- 8 Individual Colour Ink Cartridges
- New UltraChrome Hi-Gloss inks
- Direct printing on inkjet printable CD-R and DVD media
- Roll Paper
- Printing for seamless panoramic prints



Rent* \$7.27/wk

N9471 **\$649**

EPSON STYLUS CX6500 INKJET MULTI FUNCTION

- Print up to 22ppm black
- 5760 x 1440 optimised dpi using RPM technology
- EPSON DURABrite INK - for highly durable, water and smudge resistant prints
- Print BorderFree up to A4 prints
- Standalone colour copier
- Flatbed colour image scanner

RECENT RELEASE



P5731 **\$369**

EPSON STYLUS PHOTO RX510 MULTI FUNCTION

- Print up to 17ppm black, 16ppm colour
- 5760 x 1440 optimised dpi using Resolution Performance Management (RPM) technology
- Standalone colour copier
- Copy speed 10cpm black, 8cpm colour
- 2400 x 4800 dpi scanning resolution
- USB 2.0 high speed interface



L8169 **\$549**

EPSON PERFECTION 4870 PHOTO SCANNER

- Flatbed colour image scanner
- 4800 dpi with revolutionary MatrixCCD technology
- Integrated Transparency Unit (TPU) supporting four film holders
- Digital ICE - Automatic Scan Cleaning
- USB 2.0 and FireWire interfaces



Rent* \$9.18/wk

L9381 **\$819**

LATEST RELEASES!

CANON DIGITAL IXUS IIS

HOT PRICE



- 3.2 Megapixel
- 2x optical zoom
- Movie recording
- Compact and slim

M9238

\$449

CANON MV700i DV CAMERA



- Powerful Canon 18x zoom lens
- Stylish design that's easy to use
- High resolution 800k CCD
- Image stabiliser function

N0867

Rent* \$9.63/wk

\$860

CANON MV730i DV CAMERA

Rent* \$11.82/wk

N0866

\$1,055

CANON MV750i DV CAMERA

Rent* \$14.56/wk

N0864

\$1,299

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

CANON POWERSHOT A95

Intuitive control. Feature packed.

- 5 Megapixel
- Canon 3x optical zoom lens
- Movie recording and playback with sound
- DiGiC Imaging processor delivers superior digital photos
- Print/Share button allows easy 'one push' printing of images straight from the camera



Rent* \$7.61/wk

\$679

P6544

CANON POWERSHOT A400

Affordable, class leading features and style.

- 3.2 Megapixel
- Retractable Canon 2.2x optical zoom lens
- Movie recording and playback with sound.
- DiGiC Imaging processor delivers superior digital photos
- Print/Share button allows easy 'one push' printing and downloading of images



P6546

\$299

CANON POWERSHOT S70

High resolution with wide angle lens.

- 7.1 Megapixel
- Canon wide angle 3.6x optical zoom lens
- Movie recording and playback with sound
- DiGiC Imaging processor delivers superior digital photos.
- Print/Share button allows easy 'one push' printing and downloading of images



Rent* \$12.31/wk

P6547

\$1,099

CANON POWERSHOT A85

Powerful features. High image quality.

- 4.0 Megapixel
- Canon 3x optical zoom lens.
- Movie recording and playback with sound
- DiGiC Imaging processor delivers superior digital photos
- Print/Share button allows easy 'one push' printing of images straight from the camera



P2530

\$549

CANON POWERSHOT G6

Decisive control. Unrivalled performance.

- 7.1 Megapixel
- Direct photo printing capability to PictBridge compatible printers
- DiGiC Imaging processor delivers superior digital photos
- Canon 4x optical zoom lens
- Movie recording and playback with sound



Rent* \$13.43/wk

P6548

\$1,199

POWERSHOT A75 AND CP-220 BUNDLE All you need to shoot & print your photos

CANON POWERSHOT A75

3.2 Megapixel. Canon 3x optical zoom lens. Movie recording and playback with sound. DiGiC Imaging processor. Print/Share button.

COMPACT PHOTO PRINTER CP-220

Produces brilliant photo prints and stickers anytime, anywhere directly from a PictBridge compatible digital camera. Delivers high quality postcard prints in approx 85 seconds.

Offer available from 1st September to 31st October 2004, while stocks last.

Products available separately:

- N0159 PowerShot A75 camera
N9472 Compact Photo printer CP-220

\$449**\$294**

Image for illustration purposes only

Rent* \$6.71/wk

P6549

\$599

RECENT RELEASES!

PIXMA iP 4000

OUTSTANDING PHOTOS
AND DOCUMENTS

RECENT
RELEASE



- Contrast PLUS 5 Ink
- Mono 25ppm
- Colour 17ppm
- 2 pl 4800 dpi
- Camera Direct Printing

- **Advanced Media Handling:**
 - Auto Duplex Printing
 - DVD/CD Direct Printing
 - 2-way Paper Feeding

PIXMA iP 3000

UNBEATABLE VALUE.
HIGH QUALITY PHOTOS
AND DOCUMENTS

RECENT
RELEASE



- Mono 22ppm
- Colour 15ppm
- 2 pl 4800 dpi
- Camera Direct Printing

- **Advanced Media Handling:**
 - Auto Duplex Printing
 - DVD/CD Direct Printing
 - 2-way Paper Feeding

P6073 **\$289**

P6076 **\$239**

PIXMA iP 1500

HIGH PERFORMANCE PHOTOS
AND DOCUMENTS AT HOME

RECENT
RELEASE



- Mono 18ppm
- Colour 13ppm
- Borderless Printing
- 2 pl 4800 dpi
- Compact design

PIXMA iP 1000

QUALITY DOCUMENTS
MADE SIMPLE

RECENT
RELEASE



- Mono 14ppm
- Colour 11ppm
- 5 pl 4800 dpi
- Compact Design
- 5" x 7" Borderless Printing

P6077 **\$119**

P6078 **\$79**

imageCLASS MP360

All-in-one Printer,
Copier, Scanner



ALL-IN-ONE
HOT
PRICE

- Up to 18ppm black & 12ppm colour
- 4800 x 1200 dpi print resolution with 48 bit input and 24 bit output

imageCLASS MP370

All-in-one Printer,
Copier, Scanner



ALL-IN-ONE
HOT
PRICE

- Up to 18ppm mono & 12ppm colour printing
- 4800 x 1200 dpi print resolution
- Scanning at 1200 x 2400 dpi optical

imageCLASS MP390

All-in-one Printer, Copier,
Scanner & Fax



ALL-IN-ONE
HOT
PRICE

- Up to 18ppm mono & 12ppm colour printing
- 4800 x 1200 dpi print resolution
- Scanning at 1200 x 2400 dpi optical

L1318 **\$199**

L1319 **\$249**

N0289 **\$399**

i80 WIRELESS BUBBLEJET



NB. Camera not included

- Up to 14ppm in mono
- Up to 10ppm in colour
- Up to 4800 x 1200 dpi resolution
- USB for PCs & MAC

N0283

\$399

PIXMA iP 6000D

BUBBLEJET PRINTER

NEW!



Print directly from compatible digital still/video cameras or a wide range of memory cards or mobile phones.

- The 6-colour ink system.
- Colour 2.5" LCD screen
- Automatic duplexing.
- Holds up to 300 sheets
- CD and DVD printing.

P9612

\$499

CANON I9950 A3 PHOTO PRINTER



NB. Camera not included

- Up to 4800 x 2400 dpi printing
- Borderless photos up to A3+
- Up to 16ppm in black and 12ppm in colour

Rent* \$10.74/wk

N6584

\$959

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

HP DESKJETS & OFFICEJET SERIES

HP DESKJET 3845



NEW

- True-to-life photo quality
Produce rich and vivid photos with
- 4800-optimised dpi resolution
 - Optional 6-ink colour printing
 - up to 18ppm black
 - up to 14ppm in colour
 - Printer easy with an on-screen ink level indicator and a one-touch 'print cancel' button on the printer
 - Print photos with or without borders
 - Create beautiful 4" x 6" borderless photos and print photos with borders up to A4-size
 - HP reliability

P9613

\$129

HP DESKJET 6540



NEW

- printing at up to 30 ppm in black, and 20 ppm in colour features
- automatic two-sided printing and ink-backup
- Up to 4800-optimised dpi2 in colour
- 4800-optimised dpi2 mode delivers professional photo quality
- Optional 6-ink colour printing

P9614

\$299

*RENTSMART

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PLEASE NOTE:

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HP 3030 OFFICEJET ALL-IN-ONE



- Printer up to 14ppm (A4)
- First page out in 10 seconds
- 32MB RAM
- FastRes 1200
- HP PCL5e
- 6 & Postscript L2 emulation
- 150-sheet input tray
- Copier at 14cpm
- 50 page ADF
- Fax: 33.6kbps fax modem
- Scanner: 600 x 600 dpi optical
- USB & Parallel connectivity

Rent* \$7.83/wk

M7638

\$699

HP 3380 OFFICEJET ALL-IN-ONE



- Print up to 19ppm (A4)
- Resolution 1200 by 1200 dpi
- Scan resolution 600 x 600 dpi optical & 9600 x 9600 dpi enhanced resolution
- Scan quality up to 24-bit colour images
- 33.6Kbps fax modem;
- Copy speed up to 19 copies per minute
- Media handling 250 sheets covered input tray
- Up to 10,000 pages per month maximum duty cycle

Rent* \$10.86/wk

M7639

\$969

HP OFFICEJET 7140xi PRINT-FAX-SCAN-COPY



- Print up to 4800 optimised dpi in colour
- Up to 2400 x 1200 dpi in composite black on premium photo papers
- Print method: drop-on-demand thermal inkjet printing
- Print and copy up to 22ppm black and 18ppm colour
- 125 page fax memory and 100 speed dials
- 5,000 page duty cycle
- USB connectivity

HOT PRICE

Rent* \$10.07/wk

H9166

\$899

HP PSC 1315 ALL IN ONE PRINTER



- Print: (mono/colour) 17/12ppm
- 4800 x 1200 optimised dpi colour
- Scan: 600 x 2400 dpi HW
- Copy: 600 dpi mono, up to 1200 x 1200 dpi colour

P7035

\$179

HP PSC 2510 PRINTER/SCANNER/COPIER/FAX WI-FI



The HP PSC 2510 delivers home network convenience and fast, professional performance plus a host of photo features that make this all-in-one one of a kind. Built-in wireless (802.11b) and home networking supports up to five network users.

L7013

\$539



i n v e n t

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Printers

HP PRINTADVANTAGE PUTS YOUR PRINT NETWORK ON AUTO-PILOT**SIT BACK AND RELAX AS HP PRINTADVANTAGE PUTS YOUR BUSINESS IN TOUCH WITH THE LATEST PRINTING TECHNOLOGY.**

Replacing the conventional pay-per-page system, HP PrintAdvantage now integrates all of your printing costs under one fixed monthly payment. This fee covers everything from hardware and supplies to personalised service. But the benefits are far from just financial. HP PrintAdvantage offers toner delivery next day and worry-free printing with an upgraded 3 year warranty. So let HP PrintAdvantage take control of your print network and enjoy simple, cost-effective printing that lets you get on with the jobs that really count.

To find out more call Harris Technology on 1300 788 950 to speak to our sales team or log on to hprintadvantage.ht.com.au.

HP COLOR LASERJET 3500 AND PRINT ADVANTAGE LEVEL PAY CONTRACT

- Fast 12ppm black & white and colour printing
- 600 dpi with ImageREt 2400
- Smart printing technology with toner level supply status and LCD control panel
- Easy access to supplies via one door
- 64MB built-in memory
- USB interface
- 350 sheet input capacity

N9297 RENT ONLY/PER MONTH* \$192.79**HP COLOR LASERJET 3700DN AND PRINT ADVANTAGE LEVEL PAY CONTRACT**

- Fast 16ppm black & white & colour printing
- 600 dpi with ImageREt 2400
- Installed HP Jetdirect 615n Fast Ethernet internal EIO print server so the printer can be shared with a small workgroup up to 15 users.
- PCL 6 and Postscript 3 emulation
- 64MB built-in memory, expandable to 448MB
- 350 sheet input capacity

N9299 RENT ONLY/PER MONTH* \$399.43**Terms and Conditions:**

Based on 36-month finance agreement by an independent rental company (Rentsmart), terms and conditions apply.

[#]Covers hardware, support, services and supplies. Total cost based on 3 year rental: \$4,512.22. Supplies include 16 toner cartridges which cover 500 printed pages per month with 20% coverage.

[†]Covers hardware installation, support, services and supplies. Total cost based on 3 year rental: \$11,370.93. Supplies include 36 toner cartridges which cover 1250 printed pages per month with 20% coverage.

Please note supplies excludes paper. Financing provided by an independent third party and is subject to approval and availability. Above rates are based on a 36-month financing term, excludes delivery charges. Installments are payable weekly or monthly in advance. Actual weekly or monthly payments depend on the exact system selected, term of financing and then applicable rates. Down payment and other credit enhancements may apply. Rates are subject to change without notice. Other terms and conditions apply.

For Finance enquiries, please contact 1300 855 631.

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.



LASER PRINTERS

HP DESKJET 450WBT
MOBILE PRINTER

- Battery and bluetooth card included
- 9ppm in black & 8ppm in colour
- 45-page sheet feeder
- 1200dpi black & up to 4800 x 1200 optimised dpi colour (PhotoRet 4)
- HP PCL 3 enhanced
- Window and MAC compatible

N5950

\$499HP BUSINESS INKJET
PRINTER 1200d

Image for illustration purposes only

**\$50
CASH BACK**
WITH HP
TRADE-IN
PROGRAM

- Up to 28ppm black & up to 24ppm colour in fast mode
- Up to 1200 x 1200 dpi black & 4800 x 1200 optimised - dpi colour
- 32MB RAM
- Automatic two-sided printing

HP BUSINESS INKJET 1200d

P9268

\$349

HP BUSINESS INKJET 1200dtn

P9274

\$529

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

HP SPECIAL OFFER

Trade-in any brand of laser or ink printer* before 31 October 2004, and you'll **save up to 20%** on a new HP Color LaserJet printer or Business Inkjet printer.*

There has never been a better time to trade up to a new HP Color LaserJet printer or Business Inkjet printer. With increased office productivity and lower operating cost, the investment will pay for itself in no time!

Offer valid for new printer purchases between 1 June - extended until 31 October 2004. Visit www.hp.com.au/tradein for rebate amounts, order form and terms & conditions. Contact the HP Trade-In team directly via tradein.aust@hp.com or phone 1800 820 447.

*HP will accept up to 5 units per customer per month. Printers must be traded in on a 1-for-1 basis (ie. 1 old printer to 1 new printer purchased). For new HP Business Inkjet printer purchases - Trade-in printers must be HP or non-HP ink or laser printers in working condition. For new HP LaserJet printer purchases - Trade-in printers must be HP or non-HP laser printers in working condition. Free collection in metropolitan areas for old laser printers. For old inkjet printers, customers can choose to keep the printer or return to HP for recycling. The trade-in offer ends on 31 October 2004. New printers must be purchased by that date. **This offer cannot be combined with other HP LaserJet Printer Cashback Promotions.** See www.hp.com.au/tradein for full terms and conditions.

HP COLOR LASERJET 2550 SERIES


NEW PRODUCT!
**\$150
CASH BACK**
WITH HP
TRADE-IN
PROGRAM

- Prints up to 19ppm A4 mono and up to 4ppm A4 colour
- 64MB built-in SDRAM
- 600 x 600 dpi with HP ImageREt 2400
- 30,000 pages per month
- Front control panel lets you check printer supplies and status at a glance

Rent* \$10.07/wk

N5947	HP Color LaserJet 2550L	\$899
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Rent* \$13.21/wk

N6031	HP Color LaserJet 2550LN	\$1,179
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Rent* \$16.75/wk

N6032	HP Color LaserJet 2550N	\$1,495
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HP COLOR LASERJET 4650 SERIES


NEW PRODUCT!
**\$750
CASH BACK**
WITH HP
TRADE-IN
PROGRAM

- Up to 21ppm colour and black & white
- 600 x 600 dpi with HP ImageREt 3600
- 100-sheet multipurpose tray and 500-sheet input tray
- 160 MB RAM
- 533 MHz RISC processor
- 85,000 pages per month

Rent* \$33.73/wk

N5949	HP Color LaserJet 4650	\$3,399
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Rent* \$40.41/wk

N6043	HP Color LaserJet 4650DN	\$4,099
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Rent* \$52.83/wk

N6044	HP Color LaserJet 4650DTN	\$5,725
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i n v e n t

harristechnology



Printers

MONO LASERJET PRINTERS SERIES

CASH
BACK
OFFER

For a limited time receive **\$350 cash back** when you purchase an HP LaserJet 4200 series printer. Purchases must be made between 1 August - 31 October 2004. For cash back claim form and full terms and conditions, visit www.hp.com.au/promotions or call 1800 00 47 00.

HP LASERJET 1320 SERIES

Fast desktop laser printer ideal for small business workgroup or SOHO users

- Resolution: 1200 dpi
- Print speed: Up to 22ppm, letter (up to 21ppm, A4)
- First page out: 8.5 seconds
- Memory: 16 MB RAM, USB 2.0 port, IEEE 1284-B compliant parallel port



NEW

Rent* \$8.17/wk

P9319 HP LJ 1320 **\$729**

Rent* \$10.07/wk

P9320 HP LJ 1320N **\$899**

Rent* \$12.20/wk

P9321 HP LJ 1320TN **\$1,089**

HP LASERJET 2300 SERIES

- Prints up to 24ppm
- HP Fast & ProRes 1200
- 32MB expandable to 288MB
- 250 sheet tray & 100 sheet multi purpose tray
- 50,000 pages per month duty-cycle

\$250 CASH
BACK

Rent* \$15.68/wk

H9828 HP LJ 2300 **\$1,399**

Rent* \$17.09/wk

H9829 HP LJ 2300D **\$1,525**

Rent* \$20.27/wk

H9830 HP LJ 2300N **\$1,809**

Rent* \$23.70/wk

H9831 HP LJ 2300DN **\$2,115**

Rent* \$26.88/wk

H9832 HP LJ 2300DTN **\$2,599**

HP LASERJET 4200 SERIES

- Prints up to 33ppm with 300 MHz Processor
- HP Fast & ProRes 1200 - true 1200 dpi at engine speed
- 48MB RAM up to 416MB
- 2 EIO slots
- 150,000 page duty-cycle
- 500 sheet tray & 100 sheet multi-purpose tray

\$350 CASH
BACK

Rent* \$21.28/wk

G4255 HP LJ 4200 **\$1,899**

Rent* \$26.88/wk

G4256 HP LJ 4200N **\$2,599**

Rent* \$31.27/wk

G4257 HP LJ 4200TN **\$3,049**

Rent* \$34.29/wk

G6459 HP LJ 4200DTN **\$3,455**

HP LASERJET 9000 SERIES

- Prints up to 50ppm in A4
- 600dpi Ret & FastRes 1200dpi
- 64MB RAM
- 300MHz processor
- Input: 2 x 500 sheet trays
- Fast Infrared receiver (FIR)
- Parallel cable - base model only



Rent* \$59.63/wk

C3279 HP LJ 9000 **\$6,699**

Rent* \$62.30/wk

C3280 HP LJ 9000N **\$6,999**

Rent* \$73.87/wk

C3281 HP LJ 9000TN **\$8,299**

HP LASERJET 1010 SERIES



- Fast 12ppm
- USB 2.0 only
- 8MB RAM
- 150 sheet input tray
- 600 x 600 dpi with Ret
- 5,000 page duty cycle

L0085

\$279

HP LASERJET 1015 SERIES



- Fast 14ppm
- USB 2.0 and Parallel
- 16MB RAM
- 150 sheet input tray
- 1200 dpi effective output
- 7,000 page duty cycle

L0114

\$389

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

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QUALITY AND INNOVATION, NO RISK

SAMSUNG TONER

SAMSUNG SCX - 4216F
MULTI-FUNCTIONAL CENTRE
TONER CARTRIDGE

J9653

\$99

SAMSUNG SCX-4100MFP
TONER 3000 PAGE YIELD

P8099

\$105

SAMSUNG ML-1710
3000 PAGE TONER CARTRIDGE

J2380

\$110

SAMSUNG CLP-500
BLACK
TONER 7000 PAGE YIELD

M9755

\$141

SAMSUNG CLP-500
CYAN
TONER 5000 PAGE YIELD

M9756

\$164

SAMSUNG CLP-500
MAGENTA
TONER 5000 PAGE YIELD

M9757

\$164

SAMSUNG CLP-500
YELLOW
TONER 5000 PAGE YIELD

M9758

\$164***RENTSMART**

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SAMSUNG SCX - 4100

NEW!MULTIFUNCTION LASER PRINTER
WITH A SMALL FOOTPRINT

- Prints up to 14ppm in A4 (15ppm in letter), up to 600 x 600 dpi, 8 MB Memory
- Copy up to 14 ppm in A4 (15ppm in letter), up to 600 x 600 dpi
- Scans up to 4800 x 4800 dpi (enhanced) & 600 x 600 dpi (optical)

P7795

\$359

SAMSUNG ML - 1740



MEET THE SMALLEST ONE!

- World's smallest 16ppm mono laser
- 8MB RAM
- 600 x 600 dpi resolution
- 15,000 sheet duty cycle
- Windows, Macintosh and Linux compatible
- USB, IEEE 1284
- 2 year return-to-base warranty

P2581

\$259

SAMSUNG SCX - 4216F



LASER MULTIFUNCTION AT AN INKJET PRICE!

- 16ppm mono laser multifunction
- Printer/Copier/Colour Scanner/Fax
- Auto document feeder
- 33.6 kbps fax
- Telstra Duet compatible
- 250 sheet tray
- Windows only
- USB & IEEE1284 connectivity

J2137

\$489

SAMSUNG CLP - 500



COLOUR LASER PRINTER

- 5ppm colour, 20ppm mono
- Standard auto-duplexing
- Patented NoNoise system
- Quiet - a colour laser as quiet as a mono!
- Comes with a 250 sheet paper cassette and 100 sheet paper feeder
- Connectivity USB 2.0 (USB 1.1 Compatible)
- Windows compatible
- 3 years on-site warranty Australia wide

M0876

\$859

Rent* \$9.62/wk



KONICA MINOLTA

harristechnology **h_t**

Printers

THE FUTURE IN IMAGING



NEW

KONICA MINOLTA MAGICOLOR® 5430 THE MOST INNOVATIVE LASER PRINTER YET!!

With crisp and fast output, the magicolor 5430 is the most innovative laser printer in its class. With over 30 brand new features, it is sure to impress any workgroup.

- 20ppm A4 colour or mono
- 64MB RAM
- 2400 x 600 dpi resolution
- A4, letter, legal page sizes
- USB, Parallel and Network interfaces
- First Page Print Time 14.1 secs.
- GDI Printing • 520mm x 420mm footprint
- 250 Sheet input feeder

Rent* \$22.40/wk

\$1,999

P8495

KONICA MINOLTA PAGEPRO 1300W MONO LASER



- Up to 16ppm A4
- 1200 x 1200 FineART™
- First page Less than 13 seconds
- IEEE 1284 parallel

L6049

\$239



**HOT
PRICE**

KONICA MINOLTA MAGICOLOR® SC2300W COLOUR LASER PRINTER AND SCANNER

The convenience of printing, scanning and copying at your desktop. The ScanCopy® 2300W is specifically designed to meet the personal document requirements of office workers.

- Up to 4ppm in colour, 16ppm in mono printing and copying
- Windows 98SE/Me/2000/XP
- 32MB RAM Memory
- USB, IEEE 1284 parallel
- Up to A4 200-sheets multipurpose tray
- Direct scan to e-mail

Rent* \$9.92/wk

\$885

P2302



**HOT
PRICE**

KONICA MINOLTA MAGICOLOR® 2300W - AFFORDABLE COLOUR LASER PRINTER

It's the desktop-size colour laser printer with a small price to match. The magicolor® 2300W is a perfect fit for small and home offices that need a dependable, user-friendly printer.

- Print speed - up to 4ppm colour A4, 16ppm mono
- Resolution - 1200 x 600 dpi
- Interface - USB 1.1; parallel
- Windows 98SE/ME/2000/XP

Rent* \$7.49/wk

\$669

J3802



**HOT
PRICE**

KONICA MINOLTA MAGICOLOR® 3300 COLOUR LASER PRINTER

Its 24 ppm colour print speed, standard duplex and network card makes the versatile magicolor® 3300 an inspired upgrade for tired out workgroup printers

- Simplex: Colour/Mono: up to 24ppm A4
- Resolution: 1200 x 1200 dpi full speed,
- 10BaseT/100BaseTX
- Recommended Duty Cycle:
Up to 60,000 prints/month

Rent* \$30.76/wk

\$2,999

M5301



SPECIFICATIONS:

- Print Speed: up to 17ppm A4 in mono, up to 4ppm in colour
- Resolution: 9600 x 600 dpi
- Interface: ethernet (10BaseT/100BaseTX); USB 1.1, IEEE 1284 parallel
- Compatibility: Windows 95/98/Me/NT 4.0/2000/XP Macintosh OS X/iOS X Classic Linux/Unix

Rent* \$19.04/wk

\$1,699

P6519

*RENTSMART

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CHECK OUT LEXMARK'S WEBSITE FOR THEIR LATEST PROMOTIONS



Visit

www.lexmark.com.au
for your chance
to WIN a HOLDEN
COMMODORE
VY II SV8

ENTRIES CLOSE 20 OCT 2004

LEXMARK TONER

LEXMARK T SERIES

T630/T632 Return Program Print
Cartridge

K0493

\$159

T630/632 High Yield Return
Program Print Cartridge

K0496

\$359

LEXMARK C510 SERIES

C510 High Yield Cyan Cartridge

N5852

\$255

C510 High Yield Magenta
Cartridge

N5853

\$255

C510 High Yield Yellow Cartridge

N5854

\$255

C510 High Yield Black Cartridge

N5855

\$179

*RENTSMART

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conditions apply.

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available for pick-up/delivery.

LEXMARK X4270

A SMALL OFFICE AND HOME
OFFICE WORK HORSE!



- Compact solution combining phone, fax, print, copy & scan
- Black print speeds of 19ppm & fast colour speeds of 10ppm
- 33.6K modem
- 98 speed dial settings
- Fax broadcast function, fax forward function
- Caller ID support
- 1 Year Onsite Exchange LexExpress Warranty

N9595

\$215

LEXMARK E232

PERFECT FOR PERSONAL OR
BUSINESS APPLICATIONS



- Up to 21ppm A4 mono laser printer
- Fast 200MHz processor and 16MB standard
- Less than 8.5 second time to first page
- Optional 550 Sheet Input Drawer
- USB & Parallel ports standard
- 2 Year Onsite Exchange LexExpress Warranty

P2399

\$455

LEXMARK E230

AN EXCELLENT EVERY DAY
PRINTER!



- Outstanding performance in a desktop laser
- 17ppm A4 mono laser printer
- 100MHz processor and 8MB standard
- PCL6 emulation
- In-built 250-sheet paper drawer
- USB & Parallel ports standard
- 1 Year Onsite Exchange LexExpress Warranty

N9601

\$269

LEXMARK T630

ULTIMATE SCALABILITY



- 33ppm mono laser
- 32MB RAM (64MB N & DN models)
- 300MHz processor
- Parallel & USB ports standard
- 350-sheet input expandable to 3850-sheets
- 2-Years Next Business Day Onsite Warranty standard
- Put it on your network - T630n-K0331 \$1,789
- Print both sides - T630dn-M4657 - \$2,269
- Make it Multifunction - X630-K0359 - \$3,779

Rent*\$17.13/wk

K0072

\$1,529

LEXMARK X215

THE AFFORDABLE LASER
MULTIFUNCTION SOLUTION FOR
YOUR DESKTOP



- Printer - 16ppm A4 laser printer & copier
- Copier - including 30-sheet ADF (or flatbed)
- Scanner - colour scan to PC (TWAIN)
- Fax - 33.6Kbps (Super G3) fax modem
- 250-sheet input drawer
- USB & Parallel ports standard
- 1 Year LexExpress Warranty

L4391

\$519

LEXMARK C510

THE HIGH QUALITY DESKTOP
PRINTER FOR ALL YOUR
COLOUR & MONO PRINTING!



- 30ppm mono & 8ppm colour laser
- 64MB expandable to 320MB
- 500MHz processor
- 2400 image quality resolution
- PostScript 3 & PCL6 emulation
- 250-sheet input expandable to 780-sheets
- USB & Parallel ports standard
- 2-Years Next Business Day Onsite Warranty standard
- Put it on your network - C510n-N2018 - \$1,957

Rent*\$11.19/wk

N2015

\$999

IMATION™ OPTICAL, CD, DVD & TAPE STORAGE

IMATION CD-RW 10X-24X 650MB/
74MIN 5 PACK REGULAR
JEWEL CASE



N2988 **\$13**

IMATION CD-R 52X 700MB/80MIN
25 PACK SPINDLE



P6525 **\$17**

IMATION CD-R 40X 700MB/
80MIN 50 PACK NEON INFUSION
SPINDLE



L5863 **\$35**

BUSINESS SELECT CD-R
700MB/80MIN
50 PACK



N8499 **\$34**

BUSINESS SELECT CD-RW
700MB/80MIN
15 PACK



N8501 **\$24**

BUSINESS SELECT DVD+RW 2X
4.7GB MOVIE CASE 10 PACK



N8506 **\$42**

BUSINESS SELECT DVD-RW 2X
4.7GB MOVIE CASE 10 PACK



N8505 **\$42**

BUSINESS SELECT DVD-R 4X
4.7GB MOVIE CASE 10 PACK



N8502 **\$30**



IMATION DAT72 CARTRIDGE

The DAT72 format offers 72GB of compressed capacity (36GB native) and a 3MB/sec transfer rate. The DAT72 drive is also read/write compatible with DDS3 (12GB) and DDS4 (20GB) cartridges. DAT72 Cartridges are designed exclusively for DAT72 drives and libraries.

P5939 **\$39**

IMATION DISC STAKKA



- Perfect for business, studio and home use, with the Disc Stakka you need never waste time searching for a disk again!
- Stores, protects and retrieves up to 100 of your favourite CDs or DVDs.
- Fully motorised disc insert and eject helps protect your valuable discs.
- Simple to set up, linking to your computer via a single USB cable.
- Supplied with powerful OpDTracker Disc Management Software - use to capture disc content, and then search an entire database of stored discs by title, keyword, directory or file name.

M4871

\$185

DVD +/- RW EXTERNAL 8X DVD DRIVE (USB 2.0)


NEW

The new high performance Imation External DVD Burner lets you create your own custom music and multimedia on DVD recordable up to 8x speed.

Now you can share your music or photography with friends, create and save presentations to DVDs/CDs, or back up and retrieve system files with simple drag and drop functionality. You can even play pre-recorded DVD discs, including movies and other DVDs.

P8038

\$307

PLEASE NOTE:

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SONY DATA AND OPTICAL MEDIA

CD-R MEDIA



CD-R 48X 700MB 80MIN 10 PACK
IN JEWEL CASES
E1040 **\$9**

CD-R 48X 700MB 80MIN 10 PACK
IN SLIM JEWEL CASES
N0273 **\$9**

CD-R 48X 700MB 80MIN 25 PACK
SPINDLE
L7810 **\$17**

CD-R 48X 700MB 80MIN 50 PACK
SPINDLE
L7572 **\$28**

CD-R 48X 700MB 80MIN 100
PACK SPINDLE
N2887 **\$54**

DVD MEDIA



4x DVD-R 4.7GB SINGLE
JEWEL CASE
F1256 **\$2**

4x DVD-RW 4.7GB SINGLE
JEWEL CASE
N1128 **\$4**

4x DVD+R 4.7GB SINGLE
JEWEL CASE
N0978 **\$2**

4x DVD+RW 4.7GB SINGLE
JEWEL CASE
L8547 **\$4**

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LTO MEDIA

LTO-1 100-200GB
TAPE



D6131

\$55

LTO-2 200-400GB
TAPE



L6814

\$99

LTO CLEANING TAPE



N1155

\$149

AIT MEDIA

AIT-1 25-50GB TAPE



64336

\$89

AIT-1 35-90GB TAPE



B2626

\$95

AIT-2 50-100GB TAPE



80637

\$99

AIT-3 100-260GB TAPE



D6119

\$115

DLT MEDIA

SUPER DLT 160-320GB TAPE



L0008

\$99

DLT IV 20-80GB TAPE



72426

\$49

MEDIA

harristechnology



Media

AF CLEANING PRODUCTS

SCREENCLEN

- Safe to use on all laptop & computer screens including TFT & LCD
- Alcohol free, non-flammable, non-smearing
- Reduces the risk of eyestrain

250ML PUMP ACTION SPRAY



PHONECLEN

- To clean some of the 2000 bugs that can live on the average telephone mouth piece at any one time!
- Anti-bacterial, quick & easy to use



N2962 **\$7**

WIPES TUB DISPENSER 100

73275 **\$9**

20 SACHETS WET/DRY 100 SACHETS WET

73274 **\$9** N2958 **\$21**

SPRAY DUSTERS

Pure compressed gas for blowing dust, food particles, dead skin cells, nasal droppings, eyelashes, hair & other debris from computer equipment



AEROSOL 200ML INVERTIBLE AEROSOL 300ML SUPER DUSTER

N2966 **\$16** N2967 **\$22**

WIPES TUB DISPENSER 100

N2965 **\$9**

100 SACHETS WET

K9415 **\$29**

LAPTOP CLEN

Screenclene wipes for Laptops, Notebooks, PDA's & Touchpad's alcohol free, anti-static non-flammable, non-smearing, reduces the risk of eye strain.



AF LAPTOP CLEN LTC005 WET/DRY PACK OF 5 SACHETS IN RESEALABLE PLASTIC BAG

P8993 **\$7**



SAFE CLOTHS

Non woven cloths for general cleaning applications.



N2963 Pack of 25 **\$12**

P8995 Pack of 50 **\$25**

CD & DVD LENS CLEN

Automatic loading on most drives with 5 second cleaning cycle



P8996 **\$15**

FELLOWES MONITOR RISERS & CD/DVD LABELING KIT BONUS

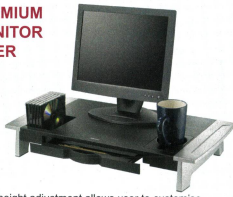
STANDARD MONITOR RISER



- Stow laptop under the monitor riser for extra desktop space.
- 5cm height adjustment allows user to place monitor at a comfortable viewing height to prevent neck strain.
- Easy access drawer for additional storage of business essentials.
- Small size saves valuable desktop space.
- Will accommodate both CRT and LCD monitors.
- 37kg weight capacity.

P9019 **\$55**

PREMIUM MONITOR RISER



- 5cm height adjustment allows user to customise viewing level to avoid neck strain.
- Built-in storage – stores 8 CD/DVD cases.
- Includes cup holder to keep your favourite drink at hand and prevent spills.
- Storage compartments can be covered over for extra work space.
- Easy access drawer organises business essentials.
- Store keyboard or laptop under the monitor riser for extra desktop space.
- 37kg weight capacity.

P9018 **\$69**

Fellowes®

CD/DVD LABELING KIT MEDIAFACE 4.0

BONUS
50 MATTE LABELS



Kit includes;

1. MediaFACE 4.0 Design Software.
2. Patented CD/DVD Label applicator.
3. Assortment of 80 professional looking labels.

P9017 **\$42**

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CD/DVD PRODUCTION

COPYCAT
DUPLICATOR

CSLCCD COPYCAT
1 to 1 Duplicator.
The cheapest and
easiest way to copy
CDs! No PC required.

J2058

HOT
PRICE

\$299

PRONTO
DUPLICATORS

Fast, small and easy to use, Pronto
works without a PC and copies up
to 100 discs unattended.

Rent* \$16.80/wk

L1539 1 CD-R \$1,499

Rent* \$25.28/wk

N9439 1 DVD±R \$2,445

*RENTSMART

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week basis over 3 years. Terms and
conditions apply.

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available for pick-up/delivery.

PRIMERA SIGNATURE Z6 CD/DVD PRINTER

Primera's newest and most advanced CD/DVD colour
printer. As a sixth-generation direct-to-disc printer, it
offers a wide range of industry leading features and
benefits, including:

- 4800 dpi print resolution
- Six-colour photo mode for the most incredible, photo
realistic printing
- Large ink cartridges for low cost per disc and
uninterrupted printing runs

P0409

Rent* \$24.30/wk

\$2,350

COPYSMARTBLAST CD AND DVD DUPLICATORS



- Burn discs fast with these new speedy stand alone
duplicators
- 52x CD or 8x DVD
- Ranging from 3 to 14 drives simultaneously burning
- Built-in Hard Disk with new USB 2.0 PC connection
for image management

BONUS
OFFERBONUS SPIN PRINTER WITH EVERY
COPYSMARTBLAST DUPLICATOR

Offer extended: 01/10/04 to 31/10/04

N2209 3 CD-R

Rent* \$12.65/wk

\$1,129

N2210 7 CD-R

Rent* \$17.92/wk

\$1,599

PRIMERA
TECHNOLOGY, INC.Signature Z6
CD/DVD PRINTERNOW
SUPPORTING
DUAL-LAYER
DVD!

N2276 3 DVD±R

Rent* \$20.00/wk

\$1,785

N2278 5 DVD±R

Rent* \$27.91/wk

\$2,699

COMBINATION BURN AND PRINT

BRAVO II DUPLICATE/PRINT

Bravo II[®]
MULTIMEDIAPRIMERA
TECHNOLOGY, INC.

- Professional, all-in-one CD/DVD publishing on your
desktop
- Totally automated and hands free
- 4800 dpi inkjet printing
- 25 disc capacity or 50 with optional kiosk mode kit
- Convenient USB 2.0 connection
- PC and MAC versions available

N2214 1 CD-R PC

Rent* \$33.73/wk

\$3,399

N2215 DVD±R PC

Rent* \$41.40/wk

\$4,199

RIMAGE 2000i CD AND DVD PUBLISHERS

RIMAGE[®]

- Brand new sleek look CD and DVD Publishers
- 2 drives CD or DVD
- 100 disc capacity
- Incorporates new 480i CD/DVD Printer
- Network software supports PC or MAC clients
- Plug and Play
- 2 units can be daisy-chained to one PC

N2212 2 CD-R

Rent* \$57.20/wk

\$6,199

N2213 2 DVD±R

Rent* \$62.30/wk

\$6,999

Pioneer

harris technology



Storage

DVD WRITERS

INTERNAL & EXTERNAL DVD/CD WRITERS MULTI-FORMAT COMPATIBILITY

Pioneer launches its new multiple format Internal & External DVD writers. The industry's first DVD writers to support 16x write speeds on both DVD-R/+R* along with the option to write at 4x speed on Double Layer media**.



INTERNAL MODELS DVR-A08XLA/B



EXTERNAL MODEL DVRS-806



Back view

MAIN FEATURES:

Precision recording technology: Pioneer's exclusive performance enhancing features ensure high quality recording characteristics and low operational noise.

Smart Laser Driver: Write strategy control circuitry positioned in close proximity to the writing laser limits signal delay, allowing high quality recording at high speed.

Liquid Crystal Tilt / Thickness Compensator: Provides accurate, reliable READ/WRITE performance with a variety of disc characteristics. The Liquid Crystal Compensator is an ideal solution for irregularly curved, thin/thick, and double layer discs.

Performance Adjusting Firmware: Automatically adjusts between Performance mode and Quiet mode. Achieves an ideal solution by lowering disc rotation for quieter drive performance during DVD Video and Audio CD playback, while speeding up for high performance when required.

DVR-A08XLA (INTERNAL)

P5656 BEIGE **\$268**

DVR-A08XLB (INTERNAL)

P5655 BLACK **\$268**

DVR-S806 (EXTERNAL)

P8469 **\$399**



nero6

BUNDLED SOFTWARE

Ulead DVD MovieFactory 3.5 SE Suite Deluxe:

- User-friendly DVD authoring with Dolby AC-3 audio encoder with video tutorial.

Ulead Video Studio 8 SE:

- Edit & create professional video in 3 steps. High Speed rendering & real time performance.

Ulead DVD Workshop 2 SE:

- Powerful & intuitive DVD authoring software with Dolby AC-3 encoder including sophisticated tools for menu creation & multiple audio tracks.

NERO OEM SUITE 3

- StartSmart (Standard & Expert modes)
- Nero Express 6
- InCD4
- Showtime
- Recode 2
- Cover Designer
- NeroVision Express 2 with Dolby AC-3 audio encoder.

Note: 16x Writing with the DVRS806 will only be achieved when the system specifications are equal to or greater than: Windows XP, Pentium 4 3GHz or faster, 512MB RAM

Note: Software supplied is not MAC compatible.

* Until such time as 16x media is available (expected October 2004) 16x write speeds can be achieved on selected 8x speed DVD-R/+R media types.

** 4x Double Layer media is not expected to be available until January 2005. Until then 4x write speeds can be achieved on selected +R 2.4x Double Layer media.

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HITACHI

Inspire the Next

HITACHI GLOBAL STORAGE TECHNOLOGIES

ONLY HITACHI OFFERS YOU A FULL STORAGE PRODUCT LINE, SPANNING THE RANGE FROM MICRODRIVE DIGITAL MEDIA, THROUGH TRAVELSTAR (MOBILE), DESKSTAR (DESKTOP), AND ULTRASTAR (SERVER) DRIVES.

MICRODRIVE (DIGITAL MEDIA)



High-capacity, high-performance, removable storage for portable devices. The new 4GB Microdrive lets you carry a whole continent of maps or 1,000 songs in your pocket.

P2510	2GB	\$439
		Rent* \$8.61/wk
P2511	4GB	\$769

*RENTSMART

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ULTRASTAR SCSI DRIVES BY HITACHI

SERVING UP OUTSTANDING CAPACITY, RELIABILITY AND PERFORMANCE FOR WORKSTATIONS AND SERVERS

- Capacity - 146GB, 73GB & 36GB models
- Rotational Speed - available in 10,000 RPM & 15,000 RPM models
- Interface - Ultra 320 SCSI
- 8MB multi-segmented cache
- Extremely quiet operation
- Average seek time 4.7ms provide outstanding performance
- Enhanced servo technology providing improved performance
- Warranty Period - 5 Year



M6053	73GB/10KRPM 68PIN	\$565	Rent* \$6.33/wk	M6057	146GB/10KRPM 80PIN	\$1,199	Rent* \$13.43/wk
M6054	73GB/10KRPM 80PIN	\$565	Rent* \$6.33/wk	M6062	73.9GB/15KRPM 68PIN	\$1,019	Rent* \$11.42/wk
M6056	146GB/10KRPM 68PIN	\$1,199	Rent* \$13.43/wk	M6063	73.9GB/15KRPM 80PIN	\$1,019	Rent* \$11.42/wk

DESKSTAR (DESKTOP DRIVES)

3.5-inch drives for high-performance personal computers. Hitachi Deskstar drives offer outstanding capacity and performance for advanced desktop applications.



M6037	80GB/7200RPM 2MB UATA	\$129	M4849	30GB/4200RPM 2MB	\$149
M6044	160GB/7200RPM 8MB ATA-100	\$195	P2630	30GB/5400RPM 2MB	\$165
M4172	250GB/7200RPM 8MB ATA-100	\$412	P2632	40GB/5400RPM 8MB	\$184
P2705	400GB/7200RPM 8MB ATA-100	\$829	P2633	60GB/5400RPM 8MB	\$285
P2704	400GB/7200RPM 8MB SATA-150	\$829	P2634	80GB/5400RPM 8MB	\$410

TRAVELSTAR (MOBILE DEVICES)

2.5-inch drives for mobile computing applications. The Hitachi Travelstar line of drives includes the world's fastest and largest mobile drives.





IS OLD TECHNOLOGY PROTECTING YOUR NEW DATA?

REV UP YOUR BACKUP

INTRODUCING THE IOMEGA REV 35GB/90GB⁺ DRIVE - A REVOLUTIONARY REMOVABLE HARD DISK SYSTEM FOR ALL YOUR BACKUP NEEDS.

- Fast** - transfer speeds up to 8x faster than tape* and more than twice as fast as DVD for immediate full-system recovery
- Reliable** - proven hard disk technology for ultimate reliability
- Easy** - professional backup software included
- Removable** - archive up to 90GB* on a single portable disk
- Secure** - 128 bits data encryption and password protection

Compared to DDS-4 specifications
Compressed capacity assuming 2.6:1 data compression with "high" compression setting on Iomega Automatic Backup Pro software. This capacity may vary since compression is data and software dependent.



Rent* \$7.27/wk

N1763 USB EXTERNAL

\$649

TOUCH-FREE™ BACKUP SO YOU CAN BE HANDS-FREE

Only Iomega storage devices come with the Iomega Automatic Backup Software to give you a hands-off, hassle-free approach to backing up your important files.

The easy way to save photos, music, and video.

Easy - Pre-formatted, hot plug-and-play

Secure - Automatically perform system backups and disaster recovery

Versatile - Run software applications from anywhere



Automatic Backup



K1817 120GB USB 2.0/FIREWIRE

\$345

M5540 40GB USB 2.0/FIREWIRE

\$350

P2391 160GB USB 2.0

\$389

Rent* \$6.20/wk

K1437 80GB USB 2.0

\$259

L2760 250GB USB 2.0/FIREWIRE

\$554

IOMEGA 35GB/90GB INTERNAL REV DRIVE- ATAPI



Rent* \$6.71/wk

N1764

\$599

IOMEGA NAS 320GB STORAGE SOLUTION



Protect & manage business critical information with a Microsoft Windows NAS server for the small office, small & medium sized businesses, & workgroups in a convenient desktop form factor with plug'n'play compatibility with existing network environments & Microsoft Windows Storage Server 2003 operating system for easy deployment & management.

Rent* \$25.80/wk

N9928

\$2,495

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply.

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply.

Not all items stocked in store but available for pick-up/delivery.

MAXTOR ONETOUCH™ - SMART STORAGE WITH PUSH-BUTTON BACKUP

QUICK AND EASY
INSTALLATION

- 1 **INSTALL THE SOFTWARE**
- 2 **PLUG IN THE DRIVE**
- 3 **PUSH THE BUTTON AND FOLLOW ON-SCREEN DIRECTIONS**

FEATURES

- Patent-pending Maxtor OneTouch™ technology
- Plug and play storage
- Hot-swappable
- Anodised aluminum design
- Stands vertically or horizontally
- Dantz® Retrospect® Express backup software included
- Customisable Maxtor OneTouch™ button
- Power management and on/off switch
- Whisper-quiet FDB motor
- MAC formatted (for MAC models)
- Oxford 911 chip (Firewire models)
- Connect additional drives
- Kensington security lock compatible

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy.
Delivery charges may apply.
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ONETOUCH™ SERIES

The Maxtor OneTouch™ drive - just press the button and your files are backed up in one simple step. It's simply the faster backup. Faster than CD. Faster than a floppy. Faster than removable cartridge systems. Space for your photos, videos, graphics, music, documents and more. It connects to FireWire or USB ports on a PC or MAC. It backs up with the Maxtor OneTouch™ button or runs automated backups using the included software, Dantz® Retrospect® Express. And you can customise the button to launch any application. Powerful, yet simple backup. Fast, flexible, huge capacity.



LE

Perfect for home or office

Exclusive Maxtor OneTouch™



80/120GB

The Maxtor Personal Storage™ LE external hard drive quickly adds storage and organisational space through your computer's USB port.

DV

Perfect for video editing and high-end graphics

Exclusive Maxtor OneTouch™



160/200/250GB

The Maxtor 7200RPM Hard drive featuring both Firewire (IEEE 1394, iLINK) and USB 2.0 interface ports for your PC.

XT

Perfect for storage-hungry files

Exclusive Maxtor OneTouch™



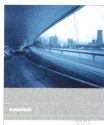
300GB

With 300GB, the Maxtor external hard drive provides you with enough capacity to hold and organise your storage-hungry applications and files.

	M1296	160GB	\$369
M1293	80GB	\$265	K7754
			200GB
K7753	120GB	\$295	\$439
	K7756	250GB	\$485

K8192	300GB	\$535
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WHAT TODAY'S CAD DESIGNERS WANT



AUTOCAD® 2005

Creating a single drawing as efficiently as possible is important. Delivering a coordinated set of drawings in a timely manner directly benefits your bottom line. With AutoCAD 2005 you can do both. Everyday tools like the table object and tool palettes boost productivity, and the new Sheet Set Manager helps you control content across entire sets of related drawings, enabling you to lower the risk for errors. Then, in a single view, you can compose and collate sheet sets and share them with your project team using plots, eTransmit, or DWF™ (Design Web Format™) files.

N0571

\$5,999



AUTOCAD LT® 2005

With AutoCAD LT 2005 you can easily create, plot, publish, and share your 2D designs. You get more done in fewer steps with a streamlined plotting interface and drafting features that boost your productivity. Quickly create tables, better manage large groups of layers, and conveniently access frequently used content to work more efficiently. Sharing your data widely is a snap: even team members without AutoCAD LT software can view and mark up your published DWF™ files, and you can instantly distribute multiple DWG files in a single step. Plus background plotting frees you to work while you print out your drawings.

N0569 FULL

\$1,950

N0570 UPGRADE*

\$639

*UPGRADE FROM LT2000i/2002/2004



VOLO™ VIEW 3

Volo View 3 software is a cost-effective, easy-to-use, digital design viewing solution that lets everyone on your team electronically review, mark up, measure and plot AutoCAD and Autodesk Inventor™ based drawings. Upgrades also available.

J6133

\$299



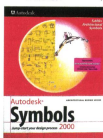
AUTOSKETCH® 9

AutoSketch 9 software provides a comprehensive set of CAD tools for creating precision drawings - from electrical details to floor plans, from conceptual sketches to product specifications, and much more.

AutoSketch 9 provides: Comprehensive CAD tools for creating expert-quality drawings • Straightforward drafting in a Windows XP - like environment • Tutorials and wizards for a fast start.

P7266

\$199



AUTODESK SYMBOLS 2000

A comprehensive library of Autodesk Symbols covering both Architectural and Engineering services. Simply drag and drop from a toolbar-style graphical interface directly into your AutoCAD drawings.

Autodesk Symbols 2000 Architectural - Contains over 5,600 symbols for building design and documentation.

Autodesk Symbols 2000 Engineering - Contains over 10,800 symbols covering all aspects of Engineering.

A1319 ARCHITECTURAL **\$199**

A1320 ENGINEERING **\$199**

STUDENT EDITION# DESIGNED FOR PROFESSIONALS, PRICED FOR STUDENTS



MANUFACTURING SERIES

- Autodesk Inventor
- Autodesk Mechanical Desktop
- AutoCAD Mechanical
- AutoCAD (included as part of AutoCAD Mechanical)

L8317

\$265*



BUILDING SERIES

- Autodesk Architectural Desktop
- AutoCAD (included as part of Autodesk Architectural Desktop)

N6783

\$265*



REVIT SERIES

- Autodesk Revit
- AutoCAD

P0137

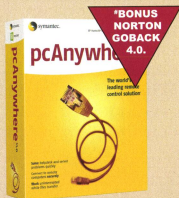
\$265*

*Proof of valid student status (of the purchaser) must be provided in order to qualify for this pricing.

PLEASE NOTE:

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SMALL BUSINESS SOLUTIONS - NEW RELEASE

**PCANYWHERE V11.0**

Symantec pcAnywhere 11.0 is the world's leading remote control solution*, with integrated tools that make it easy for helpdesk and IT personnel to resolve server and workstation problems.

V11 HOST AND REMOTEJ8955 **\$255****V11 HOST ONLY (INCL. 1 REMOTE) 5 PACK**J8957 **\$539**

*Purchase pcAnywhere 11.0 single or 5 user, retail or academic, host & remote or host only and receive a **BONUS Norton GoBack 4.0**. Bonus product is via mail-in redemption from Symantec. Offer valid for purchases between **20th September 2004 to 31st December 2004**. Entries close 14th January 2005. See on-box sticker or visit www.symantec.com/auunz-pca for full terms and conditions

*Source: 2002 IDC Worldwide Remote Control/Remote Access Software Product by Vendor by Market Share report.

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AREAS OF PROTECTION	Symantec AntiVirus™ 9.0	Symantec AntiVirus™ 9.0 with Groupware Protection	Symantec™ Client Security 2.0	Symantec™ Client Security 2.0 with Groupware Protection
DESKTOP/REMOTE PC				
REMOVES VIRUSES, WORMS, AND TROJAN HORSES AUTOMATICALLY	●	●	●	●
DETECTS CERTAIN NON-VIRUS THREATS SUCH AS SPYWARE	●	●	●	●
STOPS WORMS FROM SPREADING THROUGH EMAIL	●	●	●	●
PROTECTS COMPUTERS FROM HACKERS WITH A DESKTOP FIREWALL			●	●
BLOCKS INTERNET ATTACKS WITH INTRUSION DETECTION			●	●
NETWORK SERVER				
REMOVES VIRUSES, WORMS, AND TROJAN HORSES AUTOMATICALLY	●	●	●	●
DETECTS CERTAIN NON-VIRUS THREATS SUCH AS SPYWARE	●	●	●	●
INCLUDES A CENTRALISED CONSOLE TO INSTALL, UPDATE, AND RESPOND	●	●	●	●
MICROSOFT EXCHANGE/ LOTUS DOMINO SERVERS				
REMOVES VIRUSES, WORMS AND TROJAN HORSES IN EMAIL		●		●
FILTERS SPAM AND UNWANTED EMAIL CONTENT		●		●
PART	N7808	N7790	N7770	N7776
5 USER	\$429	\$585	\$559	\$769
PART	N7809	N7793	N7771	N7799
10 USER	\$785	\$1,095	\$1,019	\$1,415
PART	N7810	N7795	N7772	N7800
25 USER	\$1,769	\$2,495	\$2,289	\$3,219

NEW 2005 VERSIONS AVAILABLE NOW



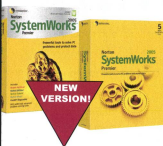
NORTON INTERNET SECURITY™ 2005

Symantec's Norton Internet Security™ 2005 provides essential protection from viruses, hackers, and privacy threats. Norton AntiVirus™ is the world's most trusted antivirus solution.* Norton™ Personal Firewall keeps personal data in and hackers out. And Norton™ Privacy Control, Norton AntiSpam™, and Norton™ Parental Control safeguard you and your family from other common online risks.

Q0503 SINGLE USER \$129
Q0504 3 USER \$189


NORTON SYSTEMWORKS™ 2005

Symantec's Norton SystemWorks™ 2005 is the smartest way to solve computer problems and protect your valuable data. This easy-to-use software helps you eliminate viruses, prevent computer problems, and restore your system to a healthy state. The improved One Button Checkup makes it easier than ever to find and fix computer problems.

Q0505 SINGLE USER \$129
Q0506 ACADEMIC \$79


NORTON SYSTEMWORKS 2005 PREMIER

Symantec's Norton SystemWorks™ 2005 Premier gives you powerful tools to solve PC problems and protect data. This easy-to-use suite helps you eliminate viruses, back up your files, and prevent computer problems.

A new recovery disk allows you to recover data even when Windows won't start up. **Includes full version of Norton Ghost 9.0.**

Norton Ghost 9.0 is developed with Drive Image™ Technology - this new technology allows users to take advantage of key features such as hot imaging, incremental backups, automatic backups and creating drive letters for images.

Q0507 SINGLE USER \$149
Q0508 5 USER \$319


NORTON PERSONAL FIREWALL 2005

Symantec's Norton™ Personal Firewall 2005 keeps personal data in and hackers out. Right out of the box, it makes your PC invisible on the Internet so that hackers can't find it. The program's intelligent intrusion prevention technology blocks suspicious Internet traffic. And easy-to-use privacy controls prevent personal information from being sent out without your knowledge.

Q0426 SINGLE USER \$89
Q0427 5 USER \$189


NORTON ANTIVIRUS™ 2005

Symantec's Norton AntiVirus™ 2005 is the world's most trusted antivirus solution.* It removes viruses, worms, and Trojan horses automatically - without interrupting your work. New Norton™ Internet Worm Protection blocks certain more sophisticated worms (such as Blaster and Sasser) before they enter your computer. Norton AntiVirus can also detect spyware and other non-virus threats.

Q0400 SINGLE USER \$69
Q0401 5 USER \$165

NORTON GOBACK 4.0



Symantec's Norton GoBack™ 4.0 allows you to easily undo PC problems. Restore your PC to a healthy state by going back minutes, hours, or even days (depending on available disk space). Also use Norton GoBack to restore files that have been deleted or modified, and to try new software safely.

Q0036
\$65

NORTON GHOST 9.0



Symantec's Norton Ghost™ 9.0 provides advanced backup and recovery for your PC. Protect your data by making a backup of your hard drive's contents - without restarting Windows. Incremental backups save you time and disk space. You can even schedule backups to run automatically. Quickly restore individual files, selected folders, or the entire hard drive.

Q0030
\$125

PLEASE NOTE:

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* Top-selling antivirus software product from December 2000 through March 2004 based on The NPD Group's retail Top Selling Business Software list.

MACROMEDIA ROBODEMO 5

ROBOHELP



Macromedia RoboHelp is the fastest, easiest way to create professional Help systems and documentation for desktop and web-based applications, including .NET and Rich Internet Applications. Create Help systems that include Help topics, Table of Contents, Index, Glossary, context-sensitive Help, and more. Generate Help systems in any popular online Help format, plus press-ready printed documentation.

INSIDE ROBOHELP

FLEXIBLE AUTHORIZING ENVIRONMENT

Work in the built-in HTML editor, any popular HTML editor such as Dreamweaver, or Microsoft Word.

POPULAR HELP FORMATS

Generate any popular online Help format, including cross-browser, cross-platform FlashHelp.

PRESS-READY PRINTED DOCUMENTATION

Generate printed documentation in Microsoft Word or PDF format.

M8175 FULL **\$1,599**

M8184 UPGRADE* **\$789**

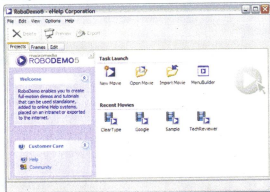
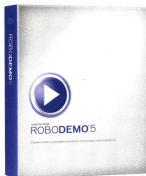
*UPGRADE FROM VERSION 4 ONLY

PLEASE NOTE:

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ROBODEMO 5

Macromedia RoboDemo is the easiest way to create interactive demonstrations and software simulations in Flash format. RoboDemo records your actions in any application and instantly creates a Flash simulation with visible and audible mouse movements. The small file size and high resolution make RoboDemo simulations and demos easy to publish online or burn to CD for use in training, sales, marketing, or user support.



EASILY CREATE SIMULATIONS & DEMOS

- Quickly create professional simulations with no programming knowledge required.
- After recording, move and delete frames as needed, or record and insert additional frames anywhere you like.

ADD SPECIAL EFFECTS & ENHANCEMENTS

- Enhance simulations with text captions, images, video, Flash animations, text animations, and hyperlinks, as well as professional voice-overs, background music, and other sound effects.
- Make simulations interactive by including click boxes, buttons, and text entry boxes.
- Create professional eLearning content, complete with multi-choice and true/false quizzes, branching, scoring, and LMS integration (SCORM 1.2 certified and AICC compliant).
- Integrate with Macromedia Authorware or Questionmark Perception

EXPORT MULTIPLE FORMATS

- Export your simulations as Flash (.swf), a self-executing file (.exe), a Microsoft Word document (.doc), a text document (.txt), a Macintosh Projector file (.hqx), or a Linux Projector file.
- Import RoboDemo simulations directly into Flash MX or Flash MX 2004 for additional enhancement, ActionScripting, or integration into a larger project. (Requires RoboDemo FLA Module, sold separately.)
- Generate simulations in Dutch, English, French, German, Italian, Norwegian, Portuguese, Spanish, and Swedish. (RoboDemo interface available in English, French, German, and Japanese.)

HOW ROBODEMO WORKS:

RoboDemo can automatically generate text captions for you, allowing you to effortlessly generate fully annotated simulations and demos. You can use these simulations as an effective way to show your applications.



1. Record your application



2. Annotate, enhance and edit



3. Publish on-line, on CD or by e-mail

Enhance your simulations by easily adding:

- Captions, audio, and images
- Flash animations and video
- Interactions with branching and scoring
- Highlights, hyperlinks, rollovers and more

N3765 FULL

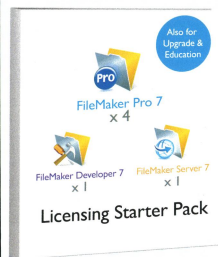
\$789

N5142 UPGRADE*

\$519

*UPGRADE FROM VERSION 4 ONLY

THE #1 EASY-TO-USE DATABASE JUST GOT BETTER!



FILEMAKER LICENSING STARTER PACK

FileMaker's Licensing Starter Pack, includes four FileMaker Pro 7 licences and one licence each of FileMaker Developer 7 and FileMaker Server 7, plus 12 months upgrade maintenance. Future purchases of upgrades or new licences will be available at the discounted Volume Licence Agreement, which is normally only available with a 10-licence minimum purchase.

This offer starts on July 21, 2004 and ends on December 23, 2004.

For full details on Filemaker offers visit www.filemaker.com.au/promos

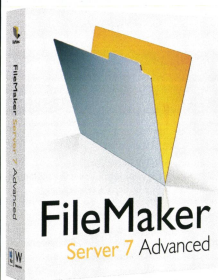
Sold individually:

N0476	FileMaker Pro 7	\$460
N0478	FileMaker Developer 7	\$835
N6744	FileMaker Server 7	\$1,699

P7317	FULL	\$4,149
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P7318	UPGRADE	\$2,069
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P7320	ACADEMIC	\$2,069
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FILEMAKER SERVER 7 ADVANCED

FileMaker Server 7 Advanced is an enhanced version of FileMaker Server 7 that includes powerful web publishing and connectivity options to efficiently manage shared database solutions from desktop to the web.

Using robust server connectivity options, FileMaker Server 7 Advanced gives you easy-to-use, yet powerful features that you can use to:

- Share FileMaker solutions over the web with up to 100 users
- Create custom web solutions that integrate with your website
- Access FileMaker data from other applications
- Share databases with 2 to 250 users
- Improve the performance of peer-to-peer database sharing
- Host massive amounts of data
- Administer databases locally or remotely
- Protect your data with additional security features

P9697	FULL	\$4,289
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P9698	ACADEMIC	\$2,195
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FILEMAKER PRO 7



FileMaker Pro 7 database software is simply the fastest, easiest way to effortlessly manage people, projects, images and information. With over 100 new and improved features, FileMaker Pro 7 will help you uncover critical business information and turn your ideas into productive, creative and customised solutions.

N0476	FULL	\$460
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N0477	UPGRADE	\$229
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FILEMAKER SERVER 7



FileMaker Server 7 is high-performance server software that efficiently manages shared database solutions. With easy to use advances in sharing and administration, as well as enhanced security features.

N6744	FULL	\$1,649
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N9186	UPGRADE	\$849
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COREL PAINTER - NEW VERSION AVAILABLE

CORELDRAW[®] ESSENTIALS 2

CorelDRAW ESSENTIALS 2 is a simple-to-use, all-in-one drawing application, with powerful photo-enhancement tools and customisable template capabilities that allow you to create professional-looking projects with ease. You can produce sophisticated graphics, correct and enhance photos, lay out your project, and publish your work in a variety of print and Web formats. Manipulate ready-made templates for fast results. Add stunning effects, see your work in real time and share it easily with others.

K8386 FULL **\$129**

*Full terms and conditions of upgrade/crossgrade are available online at ht.com.au/cat/corel

^Proof of valid student status (of the purchaser) must be provided in order to qualify for this pricing.

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

COREL PAINTER[™] IX

Corel[®] Painter[™] IX - the world's most powerful Natural-Media[®] painting and illustration software - features unique digital brushes, art materials and textures that mirror the look and feel of their traditional counterparts.

The newest version of Corel Painter takes digital design to unprecedented levels with the revolutionary Artists' Oils Painting System, Snap-to-Path Painting, Quick Clone for photographers, and brushes that perform up to ten times faster than previous versions. Corel Painter enables some of the world's most accomplished creative professionals - including commercial designers, artists, and photographers - to extend their natural talents and techniques to create original works of breathtaking digital art.

Q0500 FULL VERSION

\$699

Q0501 UPGRADE/CROSSGRADE

\$359*

Q0502 STUDENT & TEACHER ED

\$159^CORELDRAW[®] GRAPHICS SUITE 12

Introduces smart design tools for producing more creative and accurate graphics. Discover new and advanced features that increase productivity, and keep your workflow smooth with industry-standard file compatibility. With graphic design, page layout, digital imaging and motion graphics software, it is the ideal graphics suite for Windows[®].

Includes:

- CorelDRAW[®] 12
- Corel PHOTO-PAINT 12
- Corel R.A.V.E. 3
- 2 hours multimedia training CD
- Corel TRACE 12
- Corel CAPTURE 12
- 10,000 Clipart images
- 1,000 TrueTypes & Type fonts
- 1,000 Photos

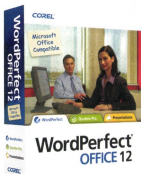
M2824 FULL VERSION

\$635

M2827 UPGRADE/CROSSGRADE

\$295*

M5735 STUDENT & TEACHER ED

\$155^WORDPERFECT[®] OFFICE 12

Boosts productivity with the trusted power of WordPerfect[®] for word processing, Quattro[®] Pro for spreadsheets and presentations for multimedia slide shows. The suite also includes an address book for managing contacts, the new WordPerfect[®] Wireless Office Suite, powered by ZIM - to keep users connected with WordPerfect[®] Office via their mobile phone, and the new WordPerfect[®] OfficeReady[™] template browser - a powerful platform for managing WordPerfect[®] Office templates including the 40 new templates bundled with WordPerfect[®] Office 12. Enhanced compatibility with Microsoft Office makes it easier than ever before to exchange information with clients using Microsoft Word, Microsoft Excel, and Microsoft PowerPoint[®].

N0829 FULL VERSION

\$449

N0830 UPGRADE/CROSSGRADE

\$239*

N0831 STUDENT & TEACHER ED

\$239^

SOFTWARE

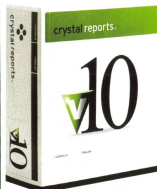
harristechnology



Software

CRYSTAL REPORTS 10

Crystal Reports is an intuitive reporting toolkit that helps you rapidly create flexible, feature-rich reports. Its proven query interface gives you access to virtually any data, including XML, OLAP, and enterprise data sources. Extensive formatting options - including grouping, field highlighting, parameters, and alerting - deliver complete control over how you present data to end users. Choose from a range of interactive views to offer end users flexible report viewing, printing, and exporting capabilities. Powerful Java, .NET and COM reporting components, and SDKs help you tightly integrate reporting functionality into web and windows applications for end user interaction and modification at runtime.



PROFESSIONAL EDITION

Suitable for business professionals within SMB and Enterprise organisations and is designed for the creation and maintenance of highly formatted reports. The product provides one license to create reports and 5 named user Crystal Enterprise Express licenses for viewing reports via a web browser. Additional Crystal Enterprise Express named user licenses can also be purchased if more viewing licenses are required.

CRYSTAL REPORTS BENEFITS

- Transform your corporate data into powerful, dynamic information
- Maintain complete control over data access and presentation
- Empower end users with rich report interaction
- Minimise requests for report modifications

M3100 FULL **\$575**

M3101 UPGRADE* **\$299**



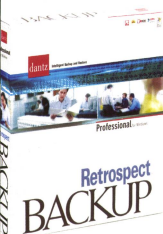
CRYSTAL ENTERPRISE EXPRESS EDITION

Is an out-of-the-box client access report delivery system which enables you to manage, secure and schedule your Crystal Reports on the Web. It includes a report publisher and Web portal interface and is ideal for reducing the overhead of delivering reports to small groups and departments. Business Objects bundles 5 named user Crystal Enterprise Express licenses into every box of Crystal Reports 10 Professional. Additional Crystal Enterprise Express licenses are available for viewing Crystal Reports via the Web.

N1183 1 USER **\$660**

*Upgrade available from any previous edition or version of Crystal Reports

DANTZ RETROSPECT 6.5 FOR WINDOWS



Dantz® Retrospect® 6.5 for Windows provides complete protection for file servers, desktops, notebooks, and business-critical applications.

RETROSPECT PROFESSIONAL - Designed for home and small office users who want to protect a single Windows computer and up to two additional networked Windows or Macintosh desktops and notebooks by backing them up to a Windows-based computer.

RETROSPECT SINGLE SERVER* - Designed for small or midsize businesses with a single server. Runs on Microsoft Windows, Macintosh and backs up and restores a single file server or business-critical application server, as well as desktops and notebooks running Windows, Macintosh and selected Unix-based operating systems.

RETROSPECT SMALL BUSINESS SERVER* - Backs up and restores a single server running Windows Small Business Server, as well as networked desktops and notebooks running Windows, Macintosh, and selected Unix based operating systems. Includes exchange agent, SQL Server agent and server disaster recovery for the Small Business Server computer.

RETROSPECT MULTI SERVER* - For small to midsize businesses with several Microsoft Windows servers. Backs up and restores computers running on Windows, Macintosh, and selected Unix operating systems.

J5589 DANTZ RETROSPECT PROFESSIONAL 6.5 **\$199**

J5602 UPGRADE FROM R/DESKTOP V5.5/5.6 OR PRO 6 **\$125**



ADD-ON PRODUCTS:

- EXCHANGE SERVER AGENT
- SQL SERVER AGENT
- ADVANCED TAPE SUPPORT
- OPEN FILE BACKUP
- PROACTIVE BACKUP
- DISASTER RECOVERY

***CALL 1300 13 9999 FOR LATEST PRICING**

PLEASE NOTE:

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SCANSOFT DOCUMENT MANAGEMENT SOLUTIONS

SCANSOFT PDF
CONVERTER 2.0
PROFESSIONAL

A bundle of ScanSoft PDF Create! and PDF Converter, PDF Converter Professional 2 significantly improves office productivity providing business professionals with the ability to more seamlessly move between the two dominant electronic document formats - Microsoft Word and PDF. With PDF Converter Professional, organisations now have access to a leading PDF creation and conversion solution with price, performance and features making the power of PDF affordable on every business desktop. PDF Converter 2 contains powerful new features that allow you to quickly convert proposals, contracts, letters and more from PDF to Microsoft Word documents for editing, saving you valuable time and money. Use the PDF creation features to produce PDF documents straight from PC applications.

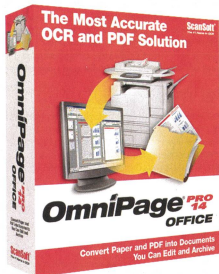
P0577 FULL

\$165

CALL OUR SALES TEAM
ON 1300 13 9999
FOR MORE INFORMATION
ON SCANSOFT LICENSING

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*Upgrade from any manufacturer's OCR software

M0918

FULL

\$1,049

M0919

UPGRADE*

\$290

D6383

FULL

\$1,179

D6384

UPGRADE

\$915

OMNIPAGE PRO 14 OFFICE

By eliminating the manual reproduction of documents, OmniPage Pro 14 Office will help your organisation reach new levels of productivity. Precision OCR technology, advanced layout analysis and powerful editing capabilities allow business professionals to quickly and cost effectively turn office documents into over 30 different PC application file formats for editing, searching and sharing with a single application. Custom workflow creation makes it easier than ever to handle large volumes of paper - helping to streamline the conversion process and complete your work faster than ever.

Quickly turn PDF files and stacks of paper - letters, contracts, tables, manuals - into easily editable word processing and spreadsheet documents. Robust new tools enable you to print to PDF, turn text documents into audio books and add digital signatures to your electronic documents. Save time and money like never before using the world's most powerful document conversion application.

Ideal for desktop, workgroup and enterprise use, OmniPage Pro 14 Office delivers everything you need to efficiently convert, edit, process, and share your paper and PDF documents.

OMNIFORM PREMIUM 5.0

OmniForm Premium 5.0 is a complete solution that enables organisations to automate filling out forms and data management. It is specifically designed to assist everyone in your organisation that needs to:

- Design forms
- Distribute forms
- Fill out forms
- Manage form data

Convert paper forms to digital, design from scratch and manage the data collection digitally with no programming experience. Its versatility enables you to implement a forms process using PDF, HTML, RTF or our own intelligent OFM format.

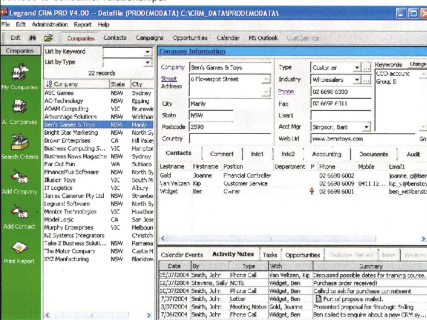
Form data is automatically filled from previously entered data, digital signatures are supported, attachments be added, and calculations, field validations are automatic. Databases are automatically created for each form for easy data analysis. Data can be exported to ODBC compliant databases such as Microsoft Access and Oracle. OmniForm Premium is the best way to stop filling forms by hand and re-keying form data.

LEGRAND CRM SOFTWARE - NEW VERSION 4

LEGRAND CRM - THE COMPLETE CUSTOMER AND SALES SOLUTION

WHAT IS CRM?

Customer Relationship Management (CRM) refers to solutions and strategies for managing your businesses' relationships with your customers. If you need to grow your clients' base, strengthen your existing customer relationships or manage your Sales team - then you need a practical, easy to use CRM tool like Legrand CRM. Using an account-centric approach, Legrand CRM makes it easy to manage your business-to-business and business-to-consumer relationships.



(1) **Marketing Campaigns**
Manage marketing campaigns and events, tracking targets and Respondents to the event, and monitoring results.

(2) **Outlook Interface**
Legrand CRM provides direct access to your Microsoft Outlook folders to transfer data back and forth.

(3) **Keywords**
Keywords are information tags that you attach to Companies or Contacts. It is a fast and efficient way of creating groups and retrieving mailing lists.

(4) **Document Storage**
Easily store and retrieve any type of document with a Company record.

(5) **Financial Data**
An import wizard enables you to import financial summaries from a text file created by your accounting system.

(6) **Optional Modules**
A number of optional modules are available to the PRO Edition.

(7) **Accounting data**
The optional Accounting Interface (PRO Edition only) provides direct access to selected accounting systems such as MYOB & Quickbooks.

(8) **Merge Templates**
Legrand CRM uses Microsoft Word for letter and report templates, and HTML for e-mail templates.

LEGRAND OPTIONAL MODULES

CUSTOMER SERVICE MODULE

The Customer Service module enables you to track customer service issues, from initial contact all the way through to resolution. Legrand CRM automatically creates an activity record when a Customer Service issue is opened, closed, reopened or re-assigned to another member of staff. Re-assigning a service issue to another staff member automatically triggers an email to that staff member to alert them that a service issue has been assigned to them. Tasks and Activity Notes are easily linked to a Customer Service issue.

PRODUCT TABLE AND ITEM TRACKING MODULE

Need to track product sales, serial numbers, warranties and service contracts? The optional PLUS module includes a Products and an "ItemsSold" database tables where you can track items that have been sold to Customers, including serial numbers, warranty date, service contract type, contract expiry date, etc...

Optional modules are available to manage Customer Service issues or tracking of items such as serial numbers, service contracts, memberships or subscriptions.

STANDARD EDITION

- Account & Contact management
- Mailing list management
- Mail merge using Microsoft Word
- Group Calendar & Tasks
- Microsoft Outlook interface
- Marketing Campaigns & Events
- Sales Opportunities
- User Login control

Q0314

SINGLE USER

\$239

Q0317

5-USER PACK

\$1,019

PROFESSIONAL EDITION

- Account & Contact management
- Mailing list management
- Mail merge using Microsoft Word
- Group Calendar & Tasks
- Microsoft Outlook interface
- Marketing Campaigns & Events
- Sales Opportunities
- User Login control
- User Rights
- Personalised Email
- "Lapsed Customer" reporting
- Multi-value Quicksearch
- Supports TAPI for incoming phone calls

Q0318

SINGLE USER

\$429

Q0319

5-USER PACK

\$1,925

ACCOUNTING INTERFACE

The Accounting Interface provides direct access to selected accounting systems; e.g. MYOB Premier and Quickbooks PRO/Premier. With a few simple clicks, your sales people and account managers can access a customer's outstanding balances, contact information, credit limit and accounting notes, all within Legrand CRM's consolidated information centre - allowing your team to operate more efficiently and more effectively.

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SOFTWARE

Software

POWERFUL ACCOUNTING SOFTWARE, QUICKEN. EASY!

Quicken

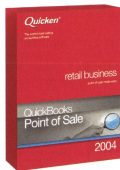
QUICKBOOKS LITE
2004 FIRST BUSINESS

QuickBooks Lite 2004 is for you if you need an accounting solution that covers the essentials.

- Fast and easy start up
- Create invoices with one click
- Write and print cheques
- Track customer payments, expenses and liabilities
- Track GST paid and collected
- Lodge Business Activity Statement online

N4138 FULL

\$99



QUICKBOOKS POINT OF SALE 2004

QuickBooks Point of Sale requires QuickBooks to run, so to complete your store solution choose from QuickBooks Pro 2004 or QuickBooks Premier 2004 and take advantage of Premier's retail specific edition.

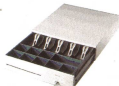
- Point of sale for fast sales processing
- Touch screen enabled
- Point of Sale enhancements to make installation & upgrades even easier
- Integration to QuickBooks Pro 2004, Premier 2004 or Premier Retail Edition 2004

N4560

FULL

\$475

BONUS

SCANNER, RECEIPT PRINTER
AND CASH DRAWER*

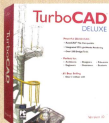
OR

INSTEAD
PAY \$395
TO RECEIVE
A TOUCH
SCREEN*

* Offers available only with every simultaneous purchase of QuickBooks Point of Sale and either QuickBooks Pro 2004 full version or QuickBooks Premier 2004 full version. Hardware via redemption from Quicken. Allow up to 30 business days for the claimed product to be sent out. Offers valid until 31 March 2005 or while stocks last. Terms and conditions apply. Pictures for illustration purposes only. Redemption forms and full terms and conditions are available at www.quicken.com.au/promotions/pops

COMPUTER-AIDED DESIGN

TurboCAD

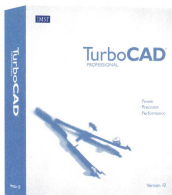
TURBOCAD
DELUXE V10.0

N9481

\$189

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TURBOCAD PROFESSIONAL V10.0

TurboCAD® Professional Version 10 achieves new levels of power and performance. Using the new HDRI (High Dynamic Range Radiance Imaging) and LightWorks® 7.3 rendering engine for more accurate and photorealistic lighting, rendering performance is up to 40% faster than previous releases. The new version also includes an updated version of Spatial's 3D ACIS® R11 solid modeling engine, improving the solid modeling performance by up to 25% over previous releases

SOME ADVANCED FEATURES INCLUDE:

- Spatial's 3D Deformable Modeling using NURBS-based objects and powerful parametric architectural features
- Class leading design and presentation tools
- Use of 2D tools while in rendered mode
- 28 of the most popular industry standard file formats including AutoCAD® DWG/DXF, Microstation® DGN, DesignCAD DCD, 3DS, IGES, STEP and STL and the option to publish your designs to HTML, JPG, and MTX

N6151

FULL

\$949

P2292

ACADEMIC

\$289

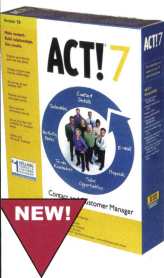
SOFTWARE

harristechnology



Software

ALWAYS STAY ON TOP OF YOUR BUSY SCHEDULE



ACT! 7 HELPS SELLING PROFESSIONALS AND SMALL BUSINESSES MAKE CONTACT, BUILD RELATIONSHIPS AND GET RESULTS.

ACT! 7 helps you:

- Gain greater customer insights by instantly accessing, organising and managing contact details.
- Manage your time more efficiently by quickly filtering, tracking and completing calls, meetings, and to-do items.
- Take important information wherever you go by easily integrating with Palm OS® and Pocket PC handheld devices.*
- Improve your bottom line by better forecasting, tracking and reporting on sales opportunities.
- Share data by easily importing and synchronising data from ACT! and other sources.

Integrates with Microsoft Outlook

- Import contact, calendar, to-do items, and other information from Outlook.
- Access your Outlook Inbox and other folders within ACT! e-mail.
- Save messages that have been sent and received in Outlook to an ACT! contact record.

Integrates with Popular Accounting Software*

- Reduce duplicate data entry, quickly synchronise contact details between ACT! and your accounting system.
- See accounting details of your customers/suppliers within ACT!'s accounting tab - from invoices, credit information, order information and much more.

ACT! Link to Pocket PC, ACT! for Palm OS®, Accounting Integration Links and ACT! for Web software is sold separately.

Q0429

FULL VERSION

\$289

ACT!

ACT! 7 FOR WORKGROUPS

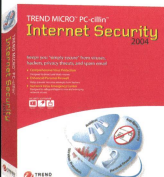


ACT! 7 for Workgroups is designed for multiple users.

Q0470 FULL

\$489

COMPLETE INTERNET SECURITY PROTECTION MADE SIMPLE



TREND MICRO™ PC-CILLIN™ INTERNET SECURITY 2004

Based on the award-winning PC-cillin™, Trend Micro™ Internet Security 2004 provides you with comprehensive, easy-to-use protection from Internet threats such as viruses, hackers, privacy threats and spam email.

- Comprehensive Virus Protection
- Enhanced Personal Firewall
- Integrated PDA Virus Protection
- **New!** Network Virus Emergency Centre
- **New!** Anti-spam Filtering
- **New!** URL Filtering/Parental Controls
- **New!** Privacy Threat Protection
- **New!** Spyware Detection and Removal
- **New!** Profile-based Security



*Purchase a FULL version of Trend Micro Internet Security 2004 (Single user, 2 User or 5 User versions) and receive a **BONUS 128MB USB 2.0 Flash Memory Drive**.

Offer valid from 01/09/2004 to 31/10/2004 or while stocks last. Supplied by redemption through Manacom. Conditions apply. See sticker on box for details.

L6315

SINGLE USER

\$89

L7326

2 USER

\$115

L7327

5 USER

\$249

USB image for illustration purposes only, product may vary.



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MICROSOFT® OFFICE PRODUCTS

MICROSOFT DIGITAL IMAGE SUITE v10



Offering you an expanded set of tools to fulfil your passion for digital photography in one powerful package, Microsoft Digital Image Suite v10 helps you effortlessly organise, enhance, share and archive your photos. Digital Image Suite includes all the new features found in Digital Image Pro and more, so if you're serious about digital photography, this is the one for you.

Edit and organise your photos:

- New Auto fix tools
- Create compelling photos
- Turn your photos into video (Windows XP required)
- Share your photo creations

P7723

\$159

MICROSOFT MONEY 2005



Microsoft Money 2005 Standard is the personal finance solution that provides fast, current answers to your basic financial questions by automatically consolidating all your online financial information.

- Get fast answers
- Focus on what's important to you
- Get automatic spending analysis
- Take care of bills automatically
- Your budget, your way

P7822

\$65**PLEASE NOTE:**

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MICROSOFT® OFFICE PROFESSIONAL EDITION 2003



#While stocks last

Microsoft Office Professional Edition 2003 is the most complete personal and business productivity solution available from Microsoft. Get everything in Small Business Edition 2003, plus:

- Database creation and management tools, with Microsoft Access.
- Full XML support in Word, Excel, and Access.
- Information Rights Management Technology (IRM).

BENEFITS

- Sell more effectively by managing customers and sales prospects.
- Lower marketing costs by creating and publishing impressive sales and marketing materials in-house - for print, Web, e-mail, presentations and CD.
- Protect your PC and your business with stronger, more secure filtering of junk e-mail and unsolicited e-mail attachments.
- Save time by handling e-mail faster with an enhanced Outlook interface and improved features.
- Efficiently and securely handle the increasing volume of e-mail and Spam and reduce the risk of virus threats.
- Enjoy true familiarity with Office 2003 and exchange Word, Excel, and PowerPoint documents seamlessly with Office 97, 2000, and XP.

L0804

FULL

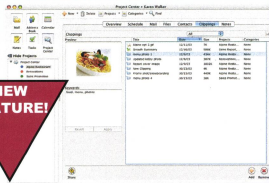
\$699#

L0805

UPGRADE

\$539

MICROSOFT® OFFICE 2004 FOR MAC PROFESSIONAL

**NEW
FEATURE!****FEATURES:****WORD NOTEBOOK LAYOUT VIEW**

Make meetings more productive by easily taking notes, searching and flagging relevant information, and recording audio directly into your documents.

IMPROVED PERFORMANCE IN VIRTUAL PC

Enhancements in Virtual PC for Mac Version 7 improve integration between the Windows operating system of your virtual machine and your Mac operating system.

G5 SUPPORT IN VIRTUAL PC

Virtual PC for Mac Version 7 supports the G5, which means you can take full advantage of PC-only software, files, networks, and printers using the latest hardware from Apple.

EXCEL PAGE LAYOUT VIEW

View and manipulate on your screen exactly what you will see on paper, including margins, headers, footers, and page count.

PROJECT CENTRE - UNIQUE TO OFFICE 2004 FOR MAC

Project Centre in Office 2004 for Mac keeps your most important information within reach by providing quick access to all the e-mails, files, contacts, and schedule information related to a specific project. It's an easy, elegant way to stay on top of it all helping you to organise both large and small projects. The Project Centre resides in Entourage (the suite's e-mail and calendaring app) but is accessible from Word, Excel, and PowerPoint. Simply click the Project Centre button and then click to create a new project. You can then name the project, assign a deadline, create tasks within it, and create links to all related notes, documents, and contact.

O0422

FULL

\$869

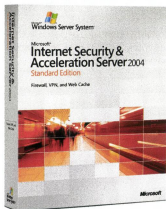
O0423

UPGRADE

\$579

Other available MAC versions include - Office Standard, Stan / Pro upgrades and Student Teacher edition.

MICROSOFT® ISA SERVER



Microsoft

Internet Security & Acceleration Server 2004

Attacks against IT networks are on the rise and becoming increasingly complex. Traditional firewalls are often inadequate to protect today's Internet-connected organisations from these attacks, potentially exposing you to business and legal risks.

INTRODUCING MICROSOFT INTERNET SECURITY AND ACCELERATION (ISA) SERVER 2004 STANDARD EDITION (SE)

The next-generation application-layer firewall, VPN, and Web-cache solution from Microsoft that enables you to easily maximise your existing IT investments in order to improve network security and performance.

ISA Server 2004 SE is an ideal integrated solution for small to medium size organisations and branch offices, and is perfect for enterprises as an in-line firewall to protect key business applications.

can help you:

Securely share information with employees, customers, and partners.

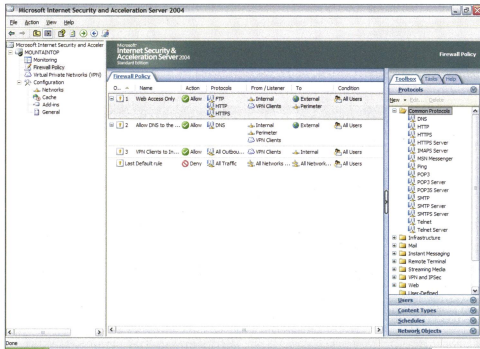
Ensure your Microsoft applications such as Microsoft Exchange Server are protected and are easily accessible.

Control Internet access to improve employee productivity and thwart malicious attacks.

Improve the performance of your network.

HOW TO LICENCE ISA SERVER 2004

ISA Server is licenced on a per-processor model. One licence is required for each processor running on the server. No client access licences are required.



ADVANCED PROTECTION BUILT IN

ISA Server 2004 SE features an updated firewall architecture that has been specifically designed to combat the latest types of Internet attacks and worms. Ideally suited to protect and extend Microsoft solutions such as Exchange and Microsoft SharePoint® servers, ISA Server 2004 SE can help you control access to these resources and provide advanced multilayer security, including at the application layer.

FAST, SECURE ACCESS

ISA Server 2004 SE includes a greatly expanded array of tools and other features in order to enable secure VPN access to your network. Improved policy-based access control allows you to restrict incoming and outgoing access. And built-in Web caching optimises bandwidth usage and accelerates Web performance. ISA Server 2004 SE can also securely extend the availability of your Exchange Servers to remote users.

EASY TO USE

A member of the Microsoft Windows Server System™ family, Microsoft ISA Server 2004 SE has been designed to work seamlessly with existing Microsoft infrastructures and applications. It offers a new, simplified user interface that can make it easier for you to implement security policies and ensure proper configuration. ISA Server 2004 SE is easy to learn, leveraging your existing knowledge of Microsoft applications. ISA Server 2004 can be remotely managed, and you can keep abreast of network access and usage through detailed logging, reporting, and alerts.

To learn more about Microsoft ISA Server 2004, please visit www.microsoft.com/isaserver.

PLEASE NOTE:

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PT173 OPEN BUSINESS LICENCE ISA SERVER STANDARD EDITION 2004 1 PROCESSOR **\$2,160***

* Media kit maybe required at additional cost

MICROSOFT WINDOWS XP WITH SERVICE PACK 2 NOW AVAILABLE

FOR CURRENT USERS OF WINDOWS XP

If you already own Windows XP, it is strongly recommended by Microsoft to download and install Service Pack 2 (SP2). To do so you can download SP2 or arrange to have it shipped on CDROM.

BROADBAND USERS

Broadband users can download Microsoft Windows XP SP2 (100MB stand alone version). Microsoft has provided SP2 for free download at www.microsoft.com/australia/windows/sp2

DIAL-UP USERS

Due to the large file size of the Service Pack, we don't recommend you download it if you are on a dial-up connection. Dial-up users can instead order a Windows XP SP2 CD online.

www.microsoft.com/australia/windows/sp2

ORDERING

If you would rather have Windows XP SP2 delivered to you, see this web address www.microsoft.com/australia/windows/sp2 to order a CD version of SP2 by mail*

*Shipping and handling costs may apply

WINDOWS XP SP2 - SYSTEM REQUIREMENTS

To install Windows XP SP2 via CD, you need:

- A PC with Windows XP Home Edition, Professional, Media Center Edition, or Tablet PC Edition installed
- 233MHz or higher processor
- 64 megabytes (MB) of RAM or higher
- 1.6 GB of available hard disk space during installation
- CD-ROM drive

*For non-commercial use only to qualified Academic users.

PLEASE NOTE:

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INTRODUCING WINDOWS XP SERVICE PACK 2 WITH ADVANCED SECURITY TECHNOLOGIES

Service Packs offer convenient, all-in-one access to the most up-to-date drivers, tools, security enhancements, and other critical updates. The latest service pack for Windows XP-Service Pack 2 (SP2)-is all about security improvements, and it's one of the most important service packs ever released.

XP SERVICE PACK 2 BENEFITS INCLUDE:

Take more control with Windows Security Centre

- Here you can check your Windows Firewall, AV Software and Windows Security updates easily in location.

Help protect your PC with the NEW Windows Firewall

- A Firewall helps you to guard against unwanted attacks on your PC when you are connected to the internet.

Block distracting pop-ups in Microsoft Internet Explorer

- Now you have the option to reduce unwanted advertising and content and stop wasted bandwidth by blocking unwanted advertising pop-ups.

Attachment Manager

- Helps protect against viruses that can spread through E-Mail, Windows Messenger and Internet Explorer by identifying potentially unsafe attachments.

Bluetooth Hardware Support

- Bluetooth is the latest in Wireless technology that enables you to link your PC with the latest Bluetooth-enabled wireless devices, including keyboards, mice, printers and mobile phones.

WINDOWS XP HOME - WITH SERVICE PACK 2 INCLUDED



• The most dependable Windows operating system yet

Windows XP sets the standard in efficient computing with a new visual design, the reliable Windows engine, and Internet security features.

• Handle digital media like a pro

Transferring footage to your computer is faster and editing is easier than ever, with everything you need to create, edit, and share your home movies.

• Get connected

Windows XP has built-in Internet, home networking, and real-time voice, video, and instant messaging support. Publish pictures to a Web site or shop online.

• Use Remote Assistance to solve problems

Invite a friend or support professional to connect to your PC over the Internet to fix a problem or answer a question.

Q0452

FULL

\$315

Q0455

UPGRADE

\$159

WINDOWS XP PROFESSIONAL - WITH SERVICE PACK 2 INCLUDED



• Added features

The Professional Edition adds security and privacy, advanced recovery options, improved network connections, and more to the features of Home Edition.

• Superior mobile support

Work offline or access your computer remotely with ease with wireless networking support, configuration wizards, improved power management and more.

• Greater security

Encrypt your files and folders with the highest levels of protection from hackers and data theft, and connect to Virtual Private Networks securely.

• Integrated and current

Integrate with Windows Servers and management solutions and keep your system current with automatic Windows Update.

Q0447

\$449

Q0458

UPGRADE

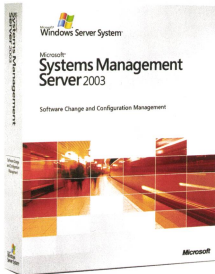
\$330

Q0459

UPGRADE - ACADEMIC*

\$129

MICROSOFT SMS SERVER 2003



Microsoft Systems Management Server 2003

As hardware and software assets constitute an increasing portion of the IT budget, corporations are becoming more focused on finding ways to reduce costs while remaining compliant with their vendors' licensing policies. Systems Management Server (SMS) 2003 delivers the necessary tools to reduce hardware and software costs while enabling IT organisations to make informed and cost-effective business decisions about infrastructure.

Systems Management Server delivers cost-effective, scalable change and configuration management for Microsoft Windows®-based desktop and server systems, and is built on industry standard protocols for compatibility with complementary tools.

FEATURES:

ASSET MANAGEMENT

As corporations are becoming more focused on reducing costs, the ability to accurately track corporate software throughout the lifecycle and stay compliant with vendors' licensing policies has become a necessity. Systems Management Server 2003 enables corporations to effectively track which applications are installed and how they are actually used, resulting in using what is paid for and paying only for what is used.

MOBILITY

Systems Management Server 2003 supports roaming and infrequently-connected users by extending its asset management and application deployment capabilities to the mobile workforce.

APPLICATION DEPLOYMENT

Systems Management Server 2003 delivers the necessary tools to plan, test, analyse, and deploy complicated on-of-business and user productivity applications, allowing enterprises to provide critical business applications throughout the organisation.

SECURITY PATCH MANAGEMENT

Systems Management Server 2003 delivers the necessary tools to enable enterprises to stay aware of the latest updates, identify software vulnerabilities, and quickly deploy updates in an accurate, verifiable, and controlled manner.

WINDOWS MANAGEMENT SERVICES INTEGRATION

To enable the reduction in costs on Microsoft Windows-based systems, the optimal solution is a management tool that takes advantage of the built-in management capabilities already present in the Windows platform. Systems Management Server 2003 reduces overall operational costs of managing software by integrating with Windows and using the native Windows management services.

HOW TO LICENSE SMS SERVER

Systems Management Server (SMS) 2003 is licensed according to a server and CAL licensing model. A server license is required per copy of SMS Server and SMS 2003 CAL is required for each device running the SMS client components that are managed by SMS.

M4700	OPEN BUSINESS LICENCE SYSTEMS MANAGEMENT SERVER ENTERPRISE 2003	\$950*
M4698	OPEN BUSINESS LICENCE SYSTEMS MANAGEMENT CAL 2003	\$69*

THREE TOP BENEFITS OF SMS SERVER 2003

APPLICATION DEPLOYMENT

For a planned deployment, it is easy to obtain the target group's current hardware base, existing applications, and version information, as well as the current service pack and hotfix levels of the system. Now you can configure SMS 2003 to get you all the asset discovery you need, and only what you need.

SECURITY PATCH MANAGEMENT

Standard Microsoft security tools like the Microsoft Baseline Security Inventory Analyzer and the Microsoft Office Inventory Tool for Updates enable you to inventory your systems for applicable patches and vulnerabilities. To assist administrators, a simple console wizard is provided to facilitate the deployment of required patches to managed devices.

ASSET MANAGEMENT - STAY COMPLIANT AND REDUCE SUPPORT COSTS

Summary and detail reports can be generated specifying which applications were used by users, how long they were used, and on which managed systems they were used. Usage can be tracked by user or computer, and reports can be created comparing concurrent usage data to current license ownership (compliance reports). Now you can configure SMS 2003 to get you all the asset discovery you need, and only what you need.

*A minimum of 5 Licences is required to start an Open Business Licence agreement. Media kit may be required at additional cost.

PLEASE NOTE:

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BUSINESS CENTRE LOCATIONS

NSW

NORTH RYDE

45 Epping Road
North Ryde NSW 2113
Phone (02) 8879 5130

NORTH SYDNEY

Ground Floor Bayer Building
275 Alfred Street North
North Sydney NSW 2060
Phone (02) 8923 9410

PARRAMATTA

46 George Street
Parramatta NSW 2150
Phone (02) 8835 4110

ALEXANDRIA

Unit 1, 110 Botany Road
Alexandria NSW 2015
Phone (02) 8306 4210

VIC

ABBOTSFORD

212 Hoddle Street
Abbotsford VIC 3067
Phone (03) 9418 4110

HAWTHORN EAST

612 Burwood Road
Hawthorn East VIC 3123
Phone (03) 9810 4610

ACT

FYSHWICK

29-31 Townsville Street
Fyshwick ACT 2609
Phone (02) 6126 3410

QLD

FORTITUDE VALLEY

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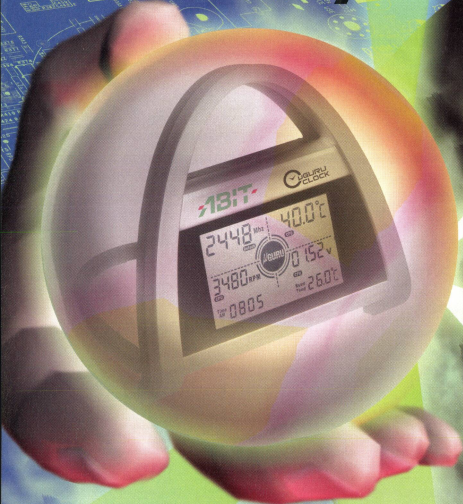
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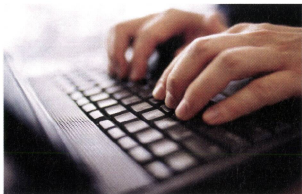
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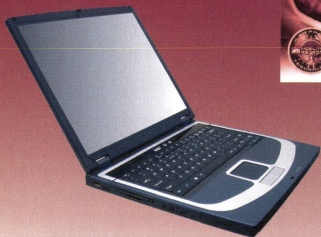
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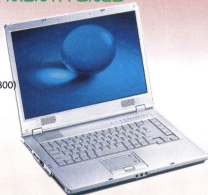
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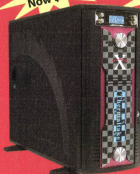
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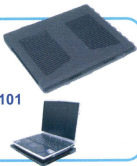


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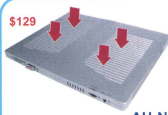
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17" 1705PS \$585
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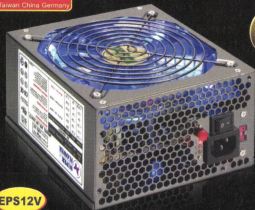
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LG 17040 10
Sony 4010 10
PRINCO
30 Spindle
4-DVD R \$30

►► 14CM POWER

 Patent
 3100550
 Taiwan China Germany

(500W) RRP \$169

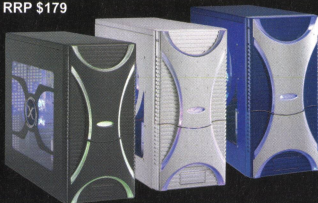

EPS12V

*Remain running fan after turning off 5 mins

ISO7779 dBA Testing
Top silence PC power supply (<21dBA)

►► XION SF-465

RRP \$179



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RRP \$69

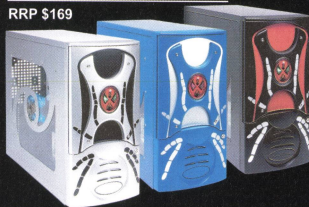


SF-609

- Fashion looking with outstanding quality.
- SUPER FLOWER be sured customer having of gamer's dreaming fan controller with high performance.

►► X-MASK SF-462

RRP \$169



- Various cooling fan supports in front, rear and side of chassis for highly efficient ventilation.
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Resales

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Marvel Computers Pty Ltd - Castle Hill

www.marvelcomputers.com.au

Eyo Technologies Pty Ltd - Padstow

www.eyo.com.au

Arc Computer - 5 locations

Chatswood, Liverpool, Parramatta

Penrith, Silverwater

www.arc.com.au

Thx Computer Systems-Sydney

www.thx.com.au

Winner It-Newcastle

www.winnercomputers.com.au

QLD:

The Disc Shop - 9 locations

Cairns, Maroochydore, Rockhampton

Toowoomba, Coopers Plains, Mansfield,

Nerang, Springfield, Townsville

www.thediscahop.com.au

Game Dude-Springwood

www.gamedude.com.au

Umart Online-Milton

www.umart.com.au

Queensland Computer

Group-Woolloongabba

www.umart.com.au

Axiom Computers-Maryborough

(07) 4123 6311

VIC:

Computer Source-Melbourne

www.computersource.com.au

It Warehouse - 6 locations

Bendigo, Box Hill, Clayton,

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www.itwarehouse.com.au

Infinity Computer Group - 8 locations

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Dandenong, Geelong, Frankston,

Sth MELBOURNE, SUNSHINE

www.infinitycomputer.com.au

Sth Melbourne, Sunshine

www.infinitycomputer.com.au

Newcomputer.com.au-Oakleigh

www.newcomputer.com.au

SA:

It Warehouse - 8 locations

Adelaide, Blair Athol,

Clovelly Park, Elizabeth, Modbury,

Noarlunga, Port Adelaide, Whyalla

www.itwarehouse.com.au
WA:

Ple Computer - Wangara

www.ple.com.au
New Zealand: (Agent)

Times Technology

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TAIWAN: (Manufacturer)

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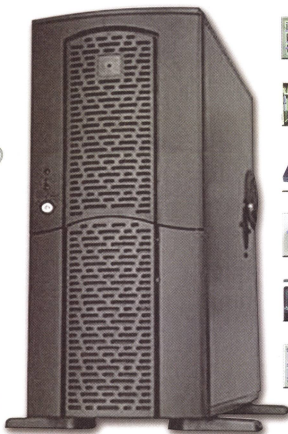
EPS 12V power 550W

24 pin power connector, 2x 5-ATA power cable incl.
Fully complies with intel 775, 915, 925 chipset
motherboard requirements



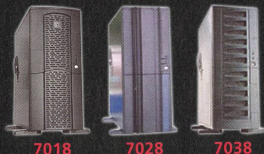
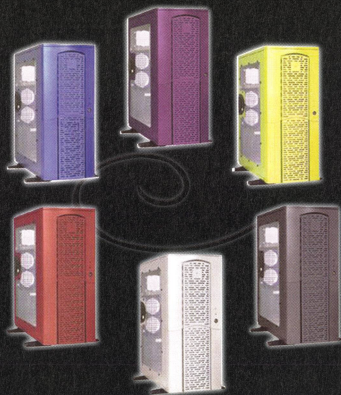
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- 2 optional fans
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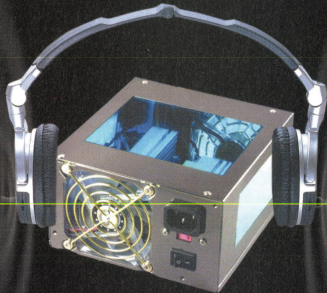
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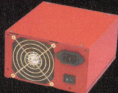


SINCE 1986
www.topower.com.tw

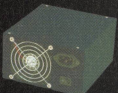
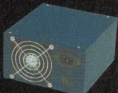


Silent Engine

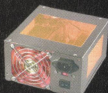
- ATX12V / EPS12V 350W-600W
- Fanless Extended 1.3 Version 420W-500W
- SFX12V / TFX12V 250W-350W
- Innovatory 6 Independent Circuitry Design
- Silent Engine / ECASO Technology
- REMI Technology / VGA 6pins for PCI EXPRESS
- Green AC Power Control
- 20-pin for ATX12V, 24-pin for BTX/EPS12V/ATX V2.2



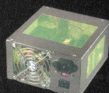
450W RRP \$169 550W RRP \$199



Available 450W-550W



400W RRP \$129



Available 400W-600W



Fanless 420W RRP \$199

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ARC COMPUTER - 5 locations
Chatswood, Liverpool, Parramatta,
Penrith, Silverwater
www.arc.com.au

THX COMPUTER SYSTEMS - CBD
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The Disc Shop - 9 locations
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Umart Online - Milton
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Queensland Computer Group - Woolloongabba
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DownTime

High-performance playtime

Personal tech

Idiot box

You need never miss your favourite shows again with one of these portable media players. Dan Warne and Jarrod Spiga tune in.

Archos AV420

▲ **Upsides:** plays DivX, XviD and MPEG-4 AVIs as well as MP3 and WMA audio stored on the 20GB hard disk (80GB also available). Acts as a PVR: record via the video input, watch recordings or play them at full resolution on your TV. Remote control included. Built-in CF card. Bright LCD screen. Mac compatible.

▼ **Downsides:** can't downscale DivXs at 640 x 352 resolution fast enough to play back without losing audio sync, though the unit's software transcodes movies down to the AV420 spec.



Details

Online	www.itechinternational.com
Price	\$1,150
Verdict	★★★★☆



Creative Zen Portable Media Centre

▲ **Upsides:** slick interface. Synchronises with Windows Media Player 10 and Windows XP Media Center Edition, so you can record TV programs on your PC then watch them on the Zen.

▼ **Downsides:** can only play WMV/WMA files, which must be transcoded in Windows Media Player 10 to the right resolution first (but as long as you have the codec on your PC, Media Player will convert any format). No Mac compatibility. DRM built in to encourage you to "rent" songs.

Details

Online	http://au.creative.com
Price	\$999
Verdict	★★★★☆

Cheap thrills

Not everyone has \$1,000 to shell out for a dedicated portable media centre. But if you own a fast Windows Mobile PDA (such as Dell's Axim X30, \$649) coupled with a decent memory card (like the Kingston 256MB Elite Pro Hi-Speed Secure Digital Card, \$94), you can play media files on it. The free PocketTV software plays DivX files encoded at the PDA's native

resolution at a decent frame rate, but despite the Axim's 624MHz CPU speed, it can't handle downscaling of TV resolution DivXs in real time, providing roughly half the normal frame rate. If you can cope with jolty video, it's a quick and affordable solution.

Details

Online	www.pockettv.com
Price	Classic, Free; Enterprise, US\$49.95
Verdict	★★★★☆



Textual healing

An interesting new twist on landline phones is the ability to send and receive real SMS. This new service is an add-on to the caller ID system, which needs to be enabled to access the add-on SMS capability from Telstra. If you send an SMS to a landline phone that doesn't have SMS capability, Telstra's service "speaks" the message.

Apart from the short messaging capability, Binatone's Symphony G10 packs some chop: the colour screen and Nokia Series 40-style menu are easy to use, and it has a range of polyphonic and ordinary ringtones. You can even play Snake. The big downside is that it uses the 2.4GHz spectrum, so it might stuff your wireless networking.



Details

Online	www.shirio.com.au
Price	\$250 to \$300
Verdict	★★★★☆

Private dick

You may not have James Bond's pulling power, but these 256MB USB memory watches can make you feel like 007 for a day.

LaCie Datawatch

▲ **Upsides:** watch those files fly... USB 2.0 speed allows copying of 100MB of data in 28 seconds. Minimal Euro styling. USB cord built into the band, and an extension cable is provided too.
▼ **Downsides:** 20% price premium for USB 2.0. Extension cable not retractable. Adjusting the time is tricky, the hand winder clicks out of adjustment mode.

Mr.Gadget Executive



▲ **Upsides:** looks slick, with a genuine leather band. Glow-in-the-dark face markers and hands. Shower resistant. Retractable USB extension cable.
▼ **Downsides:** USB 1.1 — takes two minutes and 47 seconds to copy 100MB of data. If you forget to bring the watch's cable, you can't

NewComputers Mega Memory Watch

▲ **Upsides:** cool silver and black design.
▼ **Downsides:** USB 1.1 connectivity takes two minutes and 31 seconds to copy 100MB. Why did the manufacturer have to ruin the illusion of chic by putting its name prominently on the face? Extension cable isn't retractable.



OFF THE HOOK



Details

Online www.lacie.com.au
Price \$239
Verdict ★★★★★

Details

Online www.mrgadget.com.au
Price \$179
Verdict ★★★★★

access the data unless you have a mini USB cable.

Details

Online www.newcomputers.com.au
Price \$195
Verdict ★★★★★

modpod

LinuxPod>

You can get an installation of Linux for just about anything, and now there's a special Linux distribution for the iPod called ucLinux. Originally designed to run in DVD players and other embedded hardware, it runs non-Apple programs such as the front-end interface Podzilla. Download iPodLinux from <http://sourceforge.net>. A Windows-based installer can be found at <http://sourceforge.net/projects/ipodlinuxinst>.

The best part is it doesn't wreck your iPod: a bootloader allows you to choose Linux or the Apple firmware, so the tried-and-tested iPod interface is only a restart away. It doesn't yet work on Mini or fourth-generation iPods.

Brassed off>

The iPod phenomenon is breathing new life into a range of long-forgotten products. Last month, we revealed that a leather tanning company in the US is making a killing selling sheets of transparent vinyl at US\$8 a pop to protect the iPod. This month, it's the discovery that nothing quite gets scratches off their shiny metal back better than Brasso. The user testimonials in online forums sound like late night TV programs: "It worked wonders! I can't say enough good things about it! Shined it back to a mirror like the day I bought it with only five minutes of buffing!" Of course, your mother could have told you Brasso was the answer... if only you'd asked.

Generation gap>

The latest generation iPod isn't exactly a feature-packed revision: the "hot new features" promoted by Apple include the shuffle feature being moved from a submenu to the main menu. Yawn.

Yet the fourth-generation iPod has new hardware Apple hasn't activated yet, such as an upgraded CPU and the PortalPlayer Personal Media Player: Photo Edition, which is capable of outputting photos to a TV or printer. It also includes a Wolfson Microelectronics digital audio converter (DAC) chip, which offers 3D sound enhancement, a digital graphic equaliser and automatic gain control for recorded sound. But naysayers have pointed out that earlier versions of the iPod also had unexploited capabilities...

Give passwords the finger

Peel the sticky notes off your computer monitor — the password is about to become obsolete.

Dan Warne checks out the latest in fingerprint readers.

Precise 100AX and SAFSolution Workstation software

▲Upsides:

clever spring-loaded design pops the fingerprint reader out of the PC Card when required. Easy and convenient to replace Windows login with fingerprint authentication.

▼Downsides: expensive compared to Microsoft's version. Security is only as good as Windows' password system (if fingerprint recognition isn't successful, you can enter a regular username/password) and it doesn't stop the PC from booting. It can be difficult to get the fingerprint read correctly — in testing it took an average of six attempts.



Details

Online www.comsecent.com.au

Price \$419.95

Verdict ★★★★★

Microsoft Optical Desktop with Fingerprint Reader

▲Upsides: replaces Windows login and Web page passwords with fingerprint reading. Ideal for multi-user PCs (fast user switching is actually fast), just place your finger on the reader to switch; there's no need to even go to the user switch screen. Keyboard is top-notch.

▼Downsides: "works with a range of Web browsers, pretty much across the board", according to Microsoft. Like what? Internet Explorer 6. MSN 8. MSN 9. So, basically, Internet Explorer 6.



Details

Online www.microsoft.com.au

Price \$199

Verdict ★★★★★

CECROP Biometric Fingerprint Door Lock

▲Upsides: you'll never have to worry about losing your keys again — one fingerprint and you're in. If the AA batteries in the lock run out, plug a 9V battery into the lock's terminal for temporary power. And if your finger gets cut off, you can use your other hand to open it with the supplied, unduplicatable keys.

▼Downsides: expensive. Getting the fingerprint recognised might be a bit difficult after a few drinks. No PC connectivity.



Details

Online www.eon3.com.au

Price \$1,098.90

Verdict ★★★★★

Plug and play

Who'd have guessed that so many useless gadgets could plug into the humble USB port? Dan Warne investigates.

Hot Cubby USB cup warmer

▲Upsides: our cup of Blend 43 was still warmish well after the control cup had gone stone cold.

▼Downsides: doesn't actually get very warm by itself, we suspect the neoprene wetsuit material it's made of is what keeps the cup warm. A FireWire version is eagerly anticipated.



Details

Online www.anyware.com.au

Price \$15

Verdict ★★★★★

USB Mini Aquarium

▲Upsides: keeps you company on those long, cold, lonely nights. No need to clean the tank or feed the fish. Battery back up keeps it going, and going, and going.

▼Downsides: fish swims backwards most of the time like it's photos.



Details

Online www.anyware.com.au

Price \$19

Verdict ★★★★★

USB Massage Ball

▲Upsides: in the tradition of the German toy industry, this USB device also improves circulation in some areas of the body.

▼Downsides: only suitable for use in the home — the unit's alarming sound and lack of wireless connectivity will freak out your co-workers.



Details

Online www.anyware.com.au

Price \$19

Verdict ★★★★★

USB Golf Ball

▲Upsides: a handy way to plug in USB accessories without fumbling around at the back of your PC. Also available in black (though we've never seen a black golf ball).

▼Downsides: purchase only if prepared to become the butt of "balls" and "swinger" jokes.



Details

Online www.anyware.com.au

Price \$9

Verdict ★★★★★

Wireless DivX



This wireless transmitter lets you watch that download of *One Night in Paris* on the big screen.

The Marmitek PC to TV wireless audio video sender allows you to transmit video from a PC in one room to a TV or projector in another room.

The analog 2.4GHz transmission isn't exactly private: anyone with a Gigavideo unit can tune in. But picture quality is clear and snow-free. The downside? If you've got Wi-Fi or a 2.4GHz digital cordless phone, forget it — they create visual interference.

Infra-red passthrough allows you to control your bedroom PC from the lounge room if you already have a remote control for the PC. For \$55 more you can buy a kit with ShowShifter and a top-notch universal remote that will completely control your PC and other home theatre appliances.

Details

Online www.eon3.com.au

Price \$119.90

Verdict ★★★★★

Size matters

Projector technology delivers a bigger screen experience than you'd get for the same money in plasma or LCD. *Brendan Sainsbury* sheds some light on the latest home theatre projectors.

Sony VPL-HS3

If you can get past the '70s sci-fi mushroom look, the VPL-HS3 connects to almost any device: digital, DVD, composite video, S-Video, component video or PC. HDTV is offered at a 1,280 x 720 resolution, with a true 16:9 aspect ratio, and a 3.81m image.

At 28dB it's very quiet. The lamp is rated for 3,000 hours of normal use before it needs replacing. The backlit remote offers many useful features such as aspect ratio and picture modes with one button click.

▲ **Upsides:** cheapest replacement projector lamp in this roundup (\$399). Excellent colour and contrast with digital horizontal and vertical keystone enabling off-centre placement.

▼ **Downsides:** Cables for digital and PC connections not supplied.



Details

Online www.sony.com.au

Price \$2,999

Verdict ★★★★★



BAM!!

Casio XJ-450

▲ **Upsides:** projects a huge 7.62m image at 2,800 ANSI lumens — bright enough for use with the lights on. HTPC- and HDTV-ready, with good colour and contrast, power focus and zoom, auto digital keystone correction and reasonably quiet operation at 33dB.

▼ **Downsides:** Expensive. The lamp only lasts 2,000 hours before a \$775 replacement globe is needed. Its only aspect ratio is 4:3 (16:9 is simply letterboxed). No digital input.

Details

Online www.casio.com.au

Price \$4,895

Verdict ★★★★★

InFocus x2

▲ **Upsides:** excellent 6.6m projection at 1,600 ANSI lumens — bright enough for use in rooms with a lot of ambient light. Lamp life of 3,000 hours and replacement bulbs only cost \$460. HDTV-ready with composite video and PC connections. Automatic digital keystone correction.

▼ **Downsides:** aspect ratio of 4:3 only allows letterboxed 16:9. Noisy — whirs along at 39dB. The protruding power plug on side of unit and featureless remote need redesign.



Details

Online www.au.infocus.com

Price \$2,399

Verdict ★★★★★



Sharp XV-Z10E

▲ **Upsides:** whopping 7.62m image at true 16:9 with good colour and reasonable contrast. HDTV-ready. Lamp lasts 4,000 hours in eco mode (fractionally dimmer than full brightness). Replacement lamp is only \$448.

▼ **Downsides:** PC and component input share the same socket, limiting input flexibility. Throw distance to get the maximum display size is a whopping 9.2m. Brightness level (900 ANSI lumens in eco mode) is poor.

Details

Online www.sharp.net.au

Price \$2,499

Verdict ★★★★★

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T003	\$ 9.90	T018	\$13.20	T039	\$13.70	T0491/2/3	\$ 8.90	S020187	\$ 5.60
T005	\$18.00	T019	\$ 7.70	T0321	\$15.10	T0494/5/6	\$ 8.90	S020189	\$ 6.50
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BC-05	\$50.00	\$35.00	BCI-21BK	\$13.00	\$4.90
BC-20	\$49.00	\$28.00	BCI-21C	\$28.00	\$6.40
BCI-36BK	\$25.00	\$ 8.80	BCI-24BK	\$14.00	\$5.60
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51629A (#29)	\$46.00	\$30.00	C6658AA (#58)	\$37.00	--
51645A (#45)	\$46.00	\$30.00	C8727A (#27)	\$31.00	--
51649A (#49)	\$48.00	\$30.00	C8728AA (#28)	\$35.00	--
C1816A (#16)	\$63.00	--			
C1823D (#23)	\$51.00	\$32.00			
C6578D (#78)	\$51.00	\$32.00			
C6614A (#20)	\$44.00	\$28.00			
C6615DA (#15)	\$44.00	\$28.00			
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13619HC	\$52.00		
1760050	\$46.00		
1760060	\$53.00		
1N00217	\$33.00		
1N00227	\$35.00		
1N00016	\$46.00		
1N00026	\$49.00		



Toner Cartridges

Model	Genuine	Compatible	Model	Genuine	Compatible	Model	Genuine	Refill
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HP 92298A	\$149.00	\$ 69.00	HP C4129X	\$249.00	\$115.00	Samsung ML-1710D3	\$ 98.00	\$49.00
HP C3906A	\$105.00	\$ 69.00	HP C4182X	\$285.00	\$165.00	Samsung ML-4500D3	\$ 97.00	\$49.00
HP C3903A	\$130.00	\$ 75.00	HP C7115A	\$ 99.00	\$ 59.00	Samsung ML-5200D6	\$163.00	\$65.00
HP C3909A	\$249.00	\$115.00	HP C7115X	\$125.00	\$ 85.00	Samsung ML-6060D6	\$155.00	\$65.00
HP C4092A	\$ 99.00	\$ 59.00	HP C8061X	\$195.00	\$ 85.00	Samsung SCX-4216D3	\$ 99.00	--
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Wacko: Michael and LaToya Jackson's experiment in cryogenic plastic surgery had mixed results.



Tribute: who says id Software has turned into a humorless code robot?



Online dating: "Hi, I'm Keith. I like long walks and killing demon spawn. Plz msg."

Doom 3



The biggest, baddest shooter of all time is back. Pack your next generation video cards, it's going to be a bumpy ride.

Id Software hired a professional sci-fi writer to come up with Doom 3's plot and dialogue. Now there's a challenge: you're a marine, you're on Mars, and suddenly demonic creatures are overrunning the facility you're checking out. *Cheque please!*

Things get very dark and spooky. Luckily, you have at your disposal a torch with a seemingly inexhaustible supply of juice. Because you can't use the torch and a weapon at the same time, spotlighting a monster means jumping out of your skin, fumbling with weapons in near darkness, and shooting blindly. Think *Aliens*. Think panic-induced claustrophobia. Think trouser-ruining terror.

The trouble is that after an hour or so, you realize that this is all the game consists of — get mission update, head to where you're meant to go, encounter demonic horde along the way, dispatch, proceed.

In Doom 3's defence, the execution can't be faulted. There's ample support in the audio department: you hear shrieking marines through your headset as they get munched up, and your avatar's heartbeat starts thumping in tense situations. Once again, it gets pretty tiring. The ideal solution is to break down your playing time and avoid obsessive all night binges.

There's no prizes for guessing that Nvidia cards

hold the performance edge over ATI competitors from the GeForce 6800 all the way down to those polygon grinders at the \$200 dollar mark. ATI blotted its Doom 3 copybook ages ago, leaking the game's alpha code. The frosty relations with id that followed turned positively polar when ATI signed on with Valve Software to pimp Doom 3's chief rival, *Half-Life 2*. That's right — we have officially entered the age of preferred vendor war.

If you're expecting id to have included bountiful multiplayer modes, you may be disappointed. Four player limited death match options exist, with no co-op mode officially supported at the time of writing. Further, the game seriously bogs down with more than two players in a server online.

But that's why patches were invented. These sorts of problems have occurred, and been gradually rectified, in id Software games in the past. No reason to think it won't happen again. The good news is that the game hadn't been on store shelves for two days before clever code monkeys started making modifications for it.

Doom 3 gives a wholly old-school gaming experience. It's not an emotional journey — you'll just get scared witless. True, the action tends towards the repetitive after a while, but if consumed in bite-size chunks, it's a thrilling experience.

The jury is out on multiplayer for the time being, so if you've got the hardware, invest and brag for the single player jollies.

The Lowdown

▲ **Upsides:** the graphics and physics engine; the best game visuals yet on PC.

▼ **Downsides:** repetition. It's much the same formula as 10 years ago.

Details

Contact	Activision
Online	www.doom3.com
Price	\$99.95
Verdict	★★★★★

Top 5 gaming fight club match-ups

Ever seen an annoying gaming character and wished they would get their ticket punched for good? Here are Downtime's dream bouts.

5 MARIO VERSUS THE QUAKE GUY

For many PC gamers, nothing would be finer than pointing a lightning gun at the red overalled gimp and unleashing the fury. It's brutally one-sided all the way. You've got the non-confrontational "jumping over things" guy versus the "if it moves, shoot it" guy.

It's not just his annoying "letsa go!"-speak that warrants Mario getting a beating. It's also the fact that he's stretched credibility to the

extreme by avoiding Donkey Kong for so long. We figure if he's scared of a barrel-throwing gorilla, he'd make a mess in his overalls on encountering the Quake guy.

Special offer: for this month only, we'll throw in Mario's brother Luigi in a tag-team match with the Doom guy.

Winner: The Quake guy, easy. Hammer beats rocket-launcher, uh, never. Better send flowers to mama, Luigi.



4 LORD BRITISH VERSUS MAX PAYNE

Yeah, we know Lord British is not only a star of the Ultima series but also the real life pseudonym of Richard "father of RPG computer games" Garriott. So what? We're dying to see how his "hail fellow, well met" jive goes against Max's hand cannons and tendency to shoot first, talk later.

To his advantage is the fact that usually, if you attack Lord British, you don't do any

harm. But then again, there isn't the kind of arsenal in Ultima games that there is at Max Payne's disposal.

Our analysis indicates that Lord British had better hope he saved his game before stepping into the ring — that chainmail isn't going to do much against twin machine pistols.

Winner: Max Payne. He'd pop a cap in Lord British's upper class arse before the Ultima fop could slap him with his gauntlet.



3 SAM FISHER VERSUS MASTER THIEF GARRETT

Tricky. Splinter Cell boy, with all his fancy-pants optic wire accessories, versus the back-to-basics medievalist from the Thief series. Our first instinct is to give the nod to Fisher, who at least has access to firearms, not to mention better graphics. But Garrett is famously elusive and has bizarre occult forces on his side. This one is tough to call.

Even so, we reckon Fisher would have won but for the recently released Thief: Deadly Shadows. The game revealed that Garrett has a few handy new tricks up his sleeve — he might not be able to do the Van Damme-style splits, but give him a bow and arrow and he'll make magic.

Winner: A tie. If either was losing they'd bolt — and when that happens, good luck finding them.



2 GORDON FREEMAN VERSUS BILL GATES

This is another tough one, mainly because it's almost impossible to tell them apart. If pushed, we suggest the star of Half-Life is probably a little better animated.

That's not much of a distinction though. Both faces are known to millions of gamers, and what the head of Microsoft concedes on visual appeal, he more than makes up by being able

to afford to hire Hyderabad natives to retouch his image on every PC it appears on.

Oh, and for those of you who think Bill Gates isn't a video game character, the answer is simply that when you're a billionaire, you can be anything you darn well want to be. And if BG wants you to take a fall in the seventh, you'd have to be a nutbag not to.

Winner: Bill Gates (we assume the cheque is in the mail).



1 TOMMY VERCETTI VERSUS LEISURE SUIT LARRY

In the blood-red and gunmetal grey corner, the hard man from Grand Theft Auto: Vice City. In the black and blue corner, the puny nerd who was a bad role model to more lonely men than we care to think of.

We have the feeling that, just like in his Leisure Suit series, Larry wouldn't be getting too lucky if he stepped into the ring with

Tommy Vercetti. Big Tommy wouldn't have much time for the slacker lifestyle, and we bet Vercetti's voice actor Ray Liotta could kick the arse of whoever voiced Larry as well.

In short, Vercetti would make mincemeat of the potbellied perve. About the only thing they have in common is a liking for really bad clothes and trashy women.

Winner: Vercetti by a nose. And a few fingers. Maybe an arm. All of them Larry's.





Not your typical hackers — actors from the US blockbuster *Swordfish*.

HACKERS MAKE GOOD

Dale Martin is proof that in a world awash with self-styled hacking experts, it's no longer good enough to simply have a swag of complex-sounding certificates under your belt and a host of letters after your name. No, now you've got to look the part too. Behind the *Men In Black*-style eyewear, Martin is a former juvenile IT delinquent (he got caught hacking his school's network) who grew up to graduate from Telstra into a string of impressive IT security roles, most recently with QCR Consulting.



Dale Martin

Drop it from a building and hey... what do you know... it performs the shutdown command!

NOTE: LAPTOP MAY SMASH ON IMPACT

Make what you will of Toshiba's "Accelerometer" — a mysterious new "feature" APC reader Sean O'Loughlin discovered in the user manual of his Portégé M200 notebook. According to Toshiba's instructions, when the Accelerometer is enabled you can "invoke the Start menu, switch active windows or launch predefined applications by shaking the computer vertically or horizontally, or tilting it". Helpfully, there's some safety advice: something about not braining people on public transport.

FROM APC SEPTEMBER

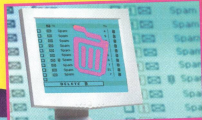
Top five ways Microsoft CIO Ron Markezich can shave US\$100 million off internal tech costs at Redmond:

1. Tone down developer events. '80s dance tracks not royalty free.
2. Buy bulk consignment of chino slacks/polo shirts.
3. Uninstall MS Office and go to www.openoffice.org.
4. Fire the entire Internet Explorer programming team and licence Firefox.
5. Fix those security bugs. Hang on, already tried that.

Contributors: Stephen Cole-Stokes, Dan Treacy,
Steven Lees-Smith, Kevin Pinel,
Daryl Keehn

SPAMTASTIC

Unsubscribenow.org helpfully wrote to let us know that "if you've received this message, then your email address has been circulating to junk mailers". By simply signing up to its service, it would let spammers know that we didn't want to receive their email any more. The only flaw in this noble quest? Sending unsolicited email to people to let them know about its service... like every other spammer.



LINUX? WE'LL TAKE CARE OF THAT



Don't let anyone tell you that Microsoft's Knowledge Base site isn't helpful; it just depends on your point of view. Linux users, for instance, might not be amused by page 31,4458 on the MS tech site titled "How to Remove Linux and Install Windows XP" (<http://support.microsoft.com/default.aspx?scid=kb;en-us;314458>). The helpful hints range from manually removing Linux partitions to formatting advice for the Linux-challenged. When installing Windows XP, the text advises, Linux partitions can be removed and new ones created with the "appropriate" file system.

PITY THE FOOL



You make my software turn to hardware

LEISURE SUIT LARRY

The lounge lizard has been around since 1987, but Larry's latest adventure has landed him in hot water. The game's transition to 3D, including a "fully realised" college campus complete with a bevy of busty babes was too much for the censors, which refused classification for *Leisure Suit Larry: Magna Cum Laude*. Issues included simulated sex, streaking and other scenes too strong for an MA 15+ rating. It's still possible the game could be classified. Send your suggestions for how Larry could win over the censors to chipchat@apcmag.com.

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